

ENGINE REVIEW: FITZPATRICK 61

April 1990

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AIRPLANE

THE WORLD'S PREMIER R/C MAGAZINE

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and the Model
GEE BEE...
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FOKKERS to PHANTOMS



MODEL AIRPLANE NEWS



ON THE COVER: Two beautiful fighter replicas fly a tighter formation than the originals ever probably achieved or even tried in WWI. The Fokker Triplane (foreground) and the Nieuport 28 are full-scale versions of the type of model flown at the Rhinebeck Jamboree, which we cover in this issue. Kodachrome by Budd Davisson.

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EDITORIAL

by RICH URAVITCH

GLOBAL GOINGS-ON



IT SURE SEEMS as though our world of R/C is broadening. Recent events in Western Europe may be contributing to this—right up there along with *perestroika* and *glasnost*. Maybe, in the not-too-distant future, we'll actually be able to bring you Field & Bench Reviews on the latest scale MiG-29 ducted-fan kit from Zakhvatchik Models!

If the people running the upcoming WRAM show have their way, the ball will certainly be rolling! This premier event, which is billed as the largest R/C aircraft exposition in the Northeast, took place on February 24 and 25 in White Plains, NY. In 1991, this annual event will have an unusual twist: a dozen members of the USSR Aero Club will enter the static competition. This should be most interesting, and I invite all Soviet modelers to participate in our "Airwaves" and "Pilot Projects" features as a prelude to this first-of-its-kind competition. Although we don't yet have subscribers in the Soviet Union, we do frequently hear from modelers in other Eastern European countries, and these may correspond with Russian modelers. If so, let's hear from you. We might even come up with some special awards for the occasion!

Equally international, and also by invitation, is the upcoming 10th International Tournament of Champions (TOC), which will be held in Las Vegas, NV, from November 8 to 11 this year. The total purse that's up for grabs among the 10 invited American and 10 foreign fliers is \$126,000! Hosted by Circus Circus Enterprises, Inc., and under the direction of Mr. Bill Bennett, who's chairman and a long-time R/C enthusiast, the prestigious event is likely to be the best yet.

Hopping the pond for a moment: if you're a Hawker Hurricane fan, you're probably not alone, and an event coming up in England could shape up to be a real extravaganza. Scheduled so that it will coincide with the fiftieth anniversary of the Battle of Britain, this event is sponsored by former Hurricane pilot Neil Hart, and it was specifically organized as a competition for large-scale R/C models of the "Hurri." August 11 and 12 are the dates, and Duxford is the site (significant because it was a Hurricane base during WW II). A prize pool of £3,000 (about \$4,700 U.S.) will be awarded to the winners in a variety of categories. For more information, contact Dave Boddington, c/o ASP, Argus House, Boundary Way, Hemel Hempstead, Herts, HP2 7ST, England, UK. If you do write, say "hi" to David for me.

International events are always exciting, and I can't tell you how much I enjoyed visiting that great state of Texas to report on the SWFF in this issue!

MODEL AIRPLANE NEWS

THE WORLD'S PREMIER R/C MODELING MAGAZINE

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DR. LOUIS V. DeFRANCESCO

Associate Publisher
YVONNE M. MICIK

Editor-in-Chief
RICH URAVITCH

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Copy Director
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funds.

MODEL AIRPLANE NEWS (ISSN No. 0026-7295) is published monthly by Air Age, Inc., 251 Danbury Rd., Wilton, CT 06897. Connecticut Editorial and Business Offices, 251 Danbury Rd., Wilton, CT 06897. Phone 203-834-2900. FAX: 203-762-9803. Y.P. Johnson, President; G.E. DeFrancesco, Vice President; L.V. DeFrancesco, Secretary; Yvonne M. Micik, Treasurer. Second Class Postage Permit paid at Wilton, Connecticut, and additional Mailing Offices. Copyright 1990 by Air Age, Inc. All rights reserved.

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EDITOR'S NOTE:

In Joe Wagner's "About Those Engines" column (February '90), we may have provided some of you (especially newcomers) with confusing information.

Joe used a "better" and "best" basis for comparing idle bar-equipped glow plugs. He suggested that, if the choice were available, you should pick an integrally machined device rather than a welded-on idle bar. Why? Just as Joe stated—because they're less likely to fail, which can result in damage to, if not destruction of, your engine. Actually, a high-quality welded-bar-type plug isn't likely to fail, so it may never present a problem.

We conducted a quick poll of some hobby shops to find out what type of idle-bar plug they carried. Two said they had some of the machined-type in stock, but nearly all said their stock consisted exclusively of welded-bar plugs. We concluded that there probably aren't that many of the "best" configuration out there, and that the "better" variety will work, and apparently has been working, just fine.

We're sorry for any confusion, and we still suggest you opt for components of demonstrated performance and reputation; it's your money, your hobby, and it should be a source of enjoyment.

RAU

Rotary-Wing Hopeful

I'm a 20-year-old student who needs a way to ease the stress and pressures of college life. I'm looking into R/C modeling, specifically helicopters, which have always fascinated me.

Since I'm new to the hobby and have never flown, I talked to some hobby shops in my area. Unfortunately, I soon realized they only wanted my money. They strongly advised that I start off with airplanes. What's your opinion? Should I learn through airplanes even though have no interest in them? (I understand that this hobby is expensive, but I'm willing to undertake the costs involved). Thanks for your advice.

DONI SANTIAGO

Winnipeg, Manitoba, Canada

Nice to hear from you, Doni. Your letter received priority status, because we feel a responsibility to get you involved in something that will ease the stress and strain of college life!

I'm afraid you've been given inaccurate advice. Some hobby dealers recommend that you learn how to fly fixed-wing first, but those same dealers usually don't stock helis and probably have never flown one! The fact is, many R/C heli fliers have never flown fixed wing, and my fixed-wing experience didn't help me a great deal. It's important to follow instructions to the letter and seek whatever help is available: talk to other heli fliers and read everything you can on the subject.

An intelligent, persevering approach (and lots of patience) will have you flying before you know it. Tell us about your experiences; they might make an interesting article and help other aspiring heli fliers.

RAU

Tri-Plane Availability

This letter is in answer to Gary Mosbley's plea for help in locating a Fokker DR-1 Triplane kit (MAN, February '90). As an avid WW I freak, I'm always looking for kits dealing with this era. I'm a Fokker history nut, too, so it's only fitting that I model some of his aircraft. (I've already built a Fokker D-VII.)

The only company I know of that makes a DR-1 kit is Flair Models in England, and its U.S. distributor is Spear Enterprises, Inc. (101 Grove St., Shrewsbury, MA 01545; (508) 752-7404.) Flair sells two sizes of DR-1, and I'm building the 1/6-scale model. In reality, it's more stand-off scale, because the nose has been lengthened to improve the in-flight stability. The cabane struts have also

(Continued on page 10)

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AIRWAVES

(Continued from page 8)

been simplified to make construction easier. The wingspan (top) is 49 inches, and it's powered by an O.S. .40 Surpass. Flair's other DR-1 is ¼ scale; it has a 73-inch wingspan and takes a .90 to 1.20 4-stroke.

By the way, the Fokker Triplane wasn't designed by Tony Fokker, but rather by his chief designer, Reinhold Platz, who designed just about all Fokker's aircraft.

I love your magazine, and I'm a very happy subscriber! Rich, I saw your Fokker D-VII and SE-5A at Rhinebeck in September—beautiful! I wanted to say hello, but you looked pretty busy. Keep up the great work!

TOM PIOREK

Thanks for the input, Tom. I completely forgot about the Flair kits, and I shouldn't have, because the company had a very busy display at the last Rhinebeck WW I contest. Although I haven't seen them, word is that the kits are nicely prepared. Perhaps we'll do a "Field & Bench Review" in a future issue.

Another source for DR-1 plans (large scale) is W.E. Technical Services (P.O. Box 76884-S, Atlanta, GA 30328) run by Bill Effinger. I've seen his plans/template packs, and they look really good.

Thanks for the kind words about my D-VII and SE-5A, but remember, I'm never too busy to talk R/C! RAU

Plans Pursuit

I'm new at the R/C airplane hobby, and I have a few questions!

How detailed are the full-size plans advertised in your magazine? Could a novice build a plane without a great deal of trouble? Do you offer any of them as kits? Are there any kits or plans to convert an Aerostar 40 into a seaplane?

I'm building an Aerostar 40 (my first plane), and for a beginner, it's

pretty good! I've had some terminology problems, but no major trouble. I'm enjoying building it so much that I can't imagine flying to be any more gratifying! Anyway, any help will be appreciated.

KIM BATCHELOR
Salem, OR

Kim, the plans offered through our full-size service are sufficiently detailed so that a modeler with some scratch-building experience can successfully duplicate models presented as construction articles. Naturally, they range in complexity from simple subjects (Randy Randolph's Chips, no. 3901) to large-scale models (Doc Linton's Vindicator, no. 9881GS). We don't offer any kits for these designs.

Converting your Aerostar 40 to a floatplane is a piece of cake, especially with all the float kits available from companies like Ace R/C, Balsa USA, Global Distributors and others. Even our own "Floating Around" guru, John Sullivan, has some that would work just fine.

We've done a floatplane issue for the past two years and find that more and more R/Cers are "taking the plunge" into this exciting form of R/C flying. Check out those back issues!

RAU

Loves Big Bombers

Hello, MAN! My wife and I are bomber fans. Believe it or not, the first aircraft that I worked on in my active-duty career was a B-17G, and that was for a static display at Randolph/Lackland AFB, TX, back in April 1977. I'd still rather work on those beauties than the jets of today.

I've seen B-17s in issues of MAN, RCM and Scale Modeler, and now Mr. Byron is building a 1/5 scale. Westcraft is mentioned, but unfortunately, I no longer have the issue in which its address appeared. Where are people getting the plans for these

birds?

We're also looking for a 1/6- or 1/5-scale B-25. Heard of any plans available? Thanks for your help, and keep up the excellent work!

MICHAEL R. MC BRIDE
Shaw A.F.B., SC

Mike, my wife and I prefer the 49ers. What league do the Bombers play in?

The last address we had for Westcraft (producers of the large-scale B-17) is 9626 Lurline St., Unit H, Chatsworth, CA 91311. If you're into scratch-building, you can buy a set of plans for a 10-foot B-17 from Bob Holman (P.O. Box 741MAN, San Bernardino, CA 92402). He also sells an accessory pack for the cowl and turrets.

Too big? Take a look at Royal's kit that uses four .20s, or the B-25 that really hauls on a pair of .40s. Not big enough? Nick Ziroli just released plans for a 100-inch B-25 that's powered by twin Zenoah G-23s. Hope we helped!

RAU

Safety First

I'm your average R/C sport flier who's a little rusty after four years in college. I've been considering doing a ducted-fan model, but as a graduate student, I can't afford models that cost \$1,000 or more to finish. I was very excited by the Fantrainer in your January '90 issue, but I have a few questions before I plunge in.

Two things about the Fantrainer's prop worry me: first, cutting a prop to fit the shroud goes against my understanding that you shouldn't alter the prop except to balance it. Second, the method of starting the engine violates my cardinal rule about placing anything near the arc of the prop. Using a ball-driver extension to engage a socket-head bolt is dangerous: the extension could get caught in the blades. Obviously, if everything works prop-

erly, there should be no problem, but how real is the danger? Other than these two items, I'm ready to send for the plans and dig out my .049!

JAMES P. FITZGERALD
Lincoln Park, NJ

Jim, I'm glad to see that safety is the focus of your letter. In many cases, the only time it's brought to our attention is after something serious has happened, usually to the "other" guy.

Altering props is frequently done to restore some of the performance that can be lost in mass production. In the case of the Fantrainer, "clipping" the tips allows the prop to function within the design's shroud. Modifying anything from its "as supplied" configuration requires that you understand why the modification is being performed and that you assume responsibility for it. Any modifications performed on a propeller should be followed by careful, accurate re-balancing.

I hate to contribute to the violation of your cardinal rule, but virtually all of today's ducted-fan planes require the use of some sort of starter extension to engage the hub of the rotor (or prop). Actually, you're not putting anything closer to the prop arc of a fan than you would using a starter on a conventional, prop-driven airplane.

Many instruments of our hobby are potentially dangerous, but recognition of, and respect for, that potential is what makes R/C as safe as it is. "What if" scenarios are great for analysis, but they eat into building and flying time. Dig out that .049; we're waiting for your plans order!

RAU

(Continued on page 12)

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AIRWAVES



Tee Dee or Queen Bee?

I'm very interested in the 1/2A Fantrainer that you featured in the January '90 issue. I have some reservations about trying to throttle the Cox TD engine via exhaust restriction, though, and would prefer to use an engine with conventional throttle and muffler.

Would the Cox Queen Bee be a suitable replacement for the TD? I have no idea what the power-to-weight ratio, rpm, etc., are for either engine. If the Queen Bee *can* be used, are there other modifications that would be required besides keeping an eye on the center of balance?

If you *don't* think the Queen Bee is a good alternative, can you suggest one? If not, I'll probably go ahead and build one with the .049 TD. This one looks too interesting to pass up.

T. SEWELL

Sharon, Ontario, Canada

Mr. Sewell, I don't think you'll be as happy with the performance of your Fantrainer if you use the Queen Bee instead of the TD. It's a great little engine, but because it's a "sport" rather than a performance type, it doesn't put out the rpm or power of its smaller-displacement brother.

Rotating throttle sleeves (which work well on the TD) are available from various sources. Check out Joe Wagner's article on throttling 1/2As in the May '89 issue of MAN.

RAU

We welcome your comments and suggestions. Letters should be addressed to "Airwaves," Model Airplane News, 251 Danbury Road, Wilton, CT 06897. Letters may be edited for clarity and brevity. We regret that, owing to the tremendous numbers of letters we receive, we cannot respond to every one.

FIFTY YEARS AGO

GETTING DEFIANT!

by KATHERINE TOLLIVER



WAS THE TWO-SEATER a better fighter than the single-seater? What about a liquid-cooled engine—would it prove its worth? The plane that would help answer these questions was England's Boulton Paul Defiant, which had just gone into production when it appeared on *MAN*'s April '40 cover.

Except for its fabric-covered control surfaces, the Defiant was constructed entirely of aluminum. It was a low-wing design with full cantilever wings and tail surfaces, a fully retractable and enclosed landing gear and an exposed hatch-type pilot and gunner's compart-

ment. A 1,030hp Rolls Royce Merlin Mark II supplied the power (some Defiants were fitted with larger engines), and its speed was estimated to be 350mph.

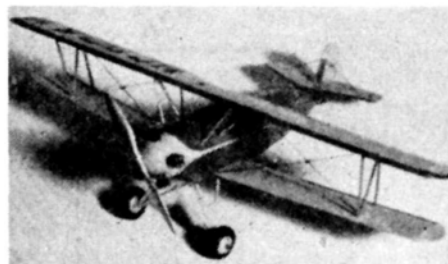
One of its new, untested features was a power-driven gun turret located amidship atop the rear fuselage. Other new features included exhaust stacks that forced the exhaust out, rather than having a pressure differential suck it out. The wing section was thicker than usual at the root along the center section, and it tapered as it



Elmer Powell with his 1st-place 54-inch-span gas job.

neared the tips of the outer panel. With a wingspan of 39 feet, 6 inches, the Defiant wasn't much bigger than the standard Hurricane fighter.

In "Gas Lines," Elmer Powell was shown with his 54-inch-span gas job that



Tad Dietrich's scale Fleet Trainer shows beautiful workmanship.

won 1st place in a contest held by the Jersey Airsquires. The average time for three flights was 3 minutes, 45 seconds on a 10-minute motor run. Three wings were tried, each with a different airfoil, but a Grant X-8 gave the best performance. Powell's plane weighed 21 ounces, which brought the wing loading to 8 ounces per square foot.

A PERFECT JOB

"One of the neatest exact scale models that we've seen" is how *MAN* described Tad Dietrich's scale Fleet Trainer. Built from plans that had previously appeared in *MAN* (it took 100 hours to complete), the model had a span of 17 inches. The propeller and the guy wires (a problem for many modelers) looked perfect on this model.

Do you prefer to carve the nose from a balsa block or to use strips of balsa? *MAN* chose the latter method as part of its construction article on the Caudron C-371 Cyclone—one of France's latest fighters. This lightweight pursuit plane was an all-wood, low-wing monoplane powered with an inverted 12-cylinder

450hp Renault engine. Its 29-foot wingspan was only 1 foot longer than its overall length. Modelers were cautioned to make this model as light as possible. The nose's difficult shape required many strips of soft $\frac{1}{32}$ -inch balsa.

A FIELD TRIP

Sandwiched between an article on the Luftwaffe and one on the Royal Airforce's latest fighter was a quiet little piece about a field in Pennsylvania. The article's author, W.W. Ely (an avid modeler) was driving by a field when he saw some boys flying their models. What does any self-respecting, old-time modeler do? He stops, of course, and throws out a few suggestions: "Wouldn't a hand drill work better than winding rubber by hand," and he tells a tale or two: "I made my first model in 1904, and the glue took forever to dry. I remember the day we played hooky, and..."

Just a field and some kids—an ordinary scene that must have been a welcome change for readers in 1940.



An exact scale model of the Caudron C-371 Cyclone.

PILOT PROJECTS

A LOOK AT WHAT OUR READERS ARE DOING!

SEND IN YOUR SNAPSHOT\$!

MAN is your magazine and, as always, we encourage reader participation. In "Pilot Projects," we'll feature pictures from you—our readers. Both color slides and color prints are acceptable.

All photos used in this section will be eligible for a grand prize of \$500, to be awarded at the end of 1990. The winner will be chosen from all entries published, so get a photo or two together plus a brief description and send it in!

*Send those pictures to:
Pilot Projects, Model Airplane News, 251 Danbury Rd., Wilton, CT 06897.*



ALL-WEATHER CUB?

Everyone loves a Cub, and John Bombardo of St. Paul, MN, is no exception. He started with a Balsa USA 1/4-scale kit, refined it and added more scale details, e.g., bungee covers, a Bob Shattleroe custom landing gear and a fiberglass cowl. To capture that elusive fuselage-to-fin "fillet," he even sewed a fabric envelope cover. A Zenoah G-23 provides power, and skis provide year-round operation. Looks great, John. Let's see some photos of your new Tri-Pacer project.

SPORT JET FOR UNDER A "C" NOTE?

Do you like your models in balsa and foam? How about scratch-building what you design? Are you just itching to try your own jet? Howard Carpenter (Kalamazoo, MI) said "yes" to all of the above. Materials for his scratch-built Skyburner 60 cost him less than 100 bucks. It's powered by a Dynamax fan that's driven by an O.S. .61VR engine. Measured thrust exceeds the all-up weight of the 9.5-pound bird, and this spells great performance, even off grass fields. Send us some plans, Howard!



IS SHERWOOD FOREST IN BEMIDJI?

This Robin Hood 99 is the handiwork of Fred Sanford (Bemidji, MN) who has been enjoying *MAN* since the late '50s and took up R/C in 1968. His RH (his first giant model) is powered by a Zenoah G-38 and tips the scales at 30 pounds. He says it's a great flier, and he recommends it as a giant trainer. Looks great, Fred, and, by the way, where is Bemidji?

NICE TO HAVE THE REAL ONE AROUND

Only the Zinger label on the prop gives this beautiful Fairchild F-24W-46 away as a model. Robert Huisinga (Freeport, IL) built it without using construction drawings. For the dimensions, he measured Charles Bell's EAA award-winning full-scale version. The Worldtex covering is finished with custom-mixed K&B Superpoxy. Robert chose a Q-50 for power and an Airtronics Spectra PCM 7, which has guided the F-24 for its 26 smooth flights. So impressed was Bob with its performance that another one is under way—from plans this time!





SPORT HORNET BLOW-UP

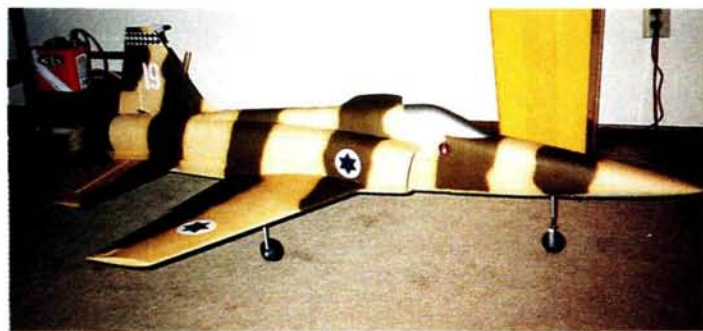
What would happen if the plan for our Sport Hornet (no. 4891) was enlarged 20 percent and a .40 was stuffed into the plane's tail? That question must have run through Lucien Miller's (Tampa, FL) mind before he embarked on the project you see here. He wanted a sparkling performer, so he fitted the Hornet with Goldberg retracts and operating gear doors that are driven by their own servo. The color scheme is accurate and vis-

ible (wise choice since this model flies at 120 to 130mph). The photo shows Lucien retrieving it after the engine flamed out on final. No, it's not a new version of lawn darts, but the nose is buried in the turf! No damage, though, and it was flying 10 minutes later! Some guys have all the luck!



LOOK OUT, EXPERIENCED MODELERS!!

Paul Snowden of Dripping Springs, TX, says he's only been in the hobby for six months and that his Great Planes Aeromaster is the second plane he's built. Now, Texans have a reputation for exaggerating just a little, but if Paul isn't, a lot of us "experienced" modelers might be pursuing the wrong hobby! No specifics were supplied, but Paul feels the Aeromaster flies well. He's received a lot of help from fellow club members, which leads me to believe that he's honest and brings me back to my original thought of changing hobbies! Hey, Paul, y'all got some time to do some MonoKotin' for me??



15 MINUTES TO REBUILD??

According to Virgil Moore of Stroud, OK, that's *not* the time it took to perform the rebuild; it's the flight time logged before the rebuild was required! Seems he "lost control" of his Top Flite P-40 Warhawk and augered it in. The restoration process has been completed on the wing and when the fuselage is finished, the "War Weary" will be better than new. Top Flite's early stand-off scale warbird still looks good. Fine choice, Virgil.



TYPICAL TEXAS TWIN?

There's nothing small about this Cessna 310G twin that was built from the Bud Nosen kit by Robert Cotton of Houston, (where else?) TX. It spans a whisker (3 inches) over 10 feet, and it's powered by a pair of S.T. 90s. Bob spent over 2 1/2 years completing the model, during which time he added scale details like functional nav lights and a rotating beacon that's perched atop the vertical fin. Robart retracts were used, and they seem quite capable of handling the Cessna's 31 pounds, which he held to that mark by using Super MonoKote as the covering material. Imagine if Bob had started with a set of B-36 plans!!

AGGRESSIVE JET

Standing down and waiting for its initial test hop (scheduled for the spring) is James Steiner's Aggressor II, which he built from a Bob Violett Models' kit. Jim finished his model with Chevron Perfect camouflage paints in the "lizard" scheme used by some of the USAF Aggressor Squadron's F-5Es. The Aggressor II uses the now-standard setup of a Violett fan unit driven by a KBV .82 engine. Retractable units are equipped with Impact Engineering gear struts to absorb the landing loads of this 10 1/2-pound beauty. Nice job, Jim. Remember to check your six!

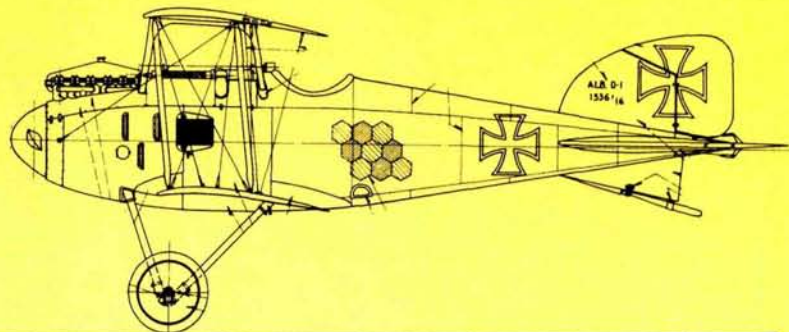


1 9 8 9

Only the fields of Flanders were missing...

by RICH URAVITCH

NESTLED AWAY IN northern New York state, within sight of the Hudson River and the Rhinecliff bridge, lies the sleepy little town of Rhinebeck. It's in this very region (so the story goes) that Ichabod Crane encountered the fabled Headless Horseman. It's also the site of the Old Rhinebeck Aerodrome where, on any weekend from June through November, visitors can actually witness a recreation of what air combat was like during WW I.



RHINEBECK

W W I J A M B O R E E



Authentic Albatros taxis by, in preparation for the full-scale air show.

On hand—and operating—are Fokker Triplanes, Sopwith Dolphins, Moranes, Albatroses, Standards, Jennies and a host of other airplanes of the period. Complementing these is a variety of other equipment of the time, and making this all happen is a salty chap by the name of Cole Palen. Now, that name may be new to you, but it's surely respected by those who know him. Mr. Palen and his band of volunteers and troupers present their show in some of the most authentic airplanes around. No restored museum pieces, these; they seem to be maintained in "flyable" condition, where the philosophy might be, "Fix it and fly it; they only need to be safe, not necessarily beautiful or pristine."

Every September, on the weekend after Labor Day, the Mid-Hudson R/C Club holds its WW I Jamboree in conjunction with Cole's show. This is frequently when non-modelers get their first look at R/C, and their reaction is amazing. To the seasoned R/Cers in attendance (and there's been a long string of Jamborees at which to become seasoned!), it's an opportunity to get together, talk and fly.

I hadn't attended this event for three years, so I was looking forward to seeing what—if anything—had changed. Most evident was the inclusion of a giant-scale category in the competition. The remaining events were as they had been; obviously, there's no reason to change a format that works as well as this one does!

The Mission event (in which contestants take off and attempt to drop a bomb in a circle, burst a balloon and execute a spot landing) was by far the most popular in terms of flights logged. Some of the 88 registered fliers performed 497 sorties in this



A pair of temporary wings broke away from this Davis D-1W during the comedy act.



Vintage, smoke-equipped Great Lakes is a great crowd-pleaser.



Tom Kosciuszko prepares to launch his Fokker DR-1 triplane in the Giant Scale event.



Left: Now you know where the term "intrepid early birdmen" comes from!

PHOTOS BY RICH DURANTCH

The authors Fokker D 7 bellows smoke during the combat event.

1989 WW I RHINEBECK JAMBOREE FINAL STANDINGS

AMA SCALE

Place ...	Contestant	Plane
1	Bud Roane	Sopwith Pup
2	Tom Polapink	Albatros DVA
3	Bob Mackey	Camel
4	Sid Rosen	Nieuport II
5	Jim McKeown	Nieuport 28

GIANT SCALE

Place ...	Contestant	Plane
1	Nick Tusa	Fokker DVII
2	Ralph Jackson	Fokker DVII
3	Bud Roane	T.M. Scout
4	Tom Kosewski	Fokker Triplane
5	Nick Zirola Jr.	Eindecker

MANEUVERS

Place ...	Contestant	Plane
1	Bud Roane	Sopwith Pup
2	Bob Mackey	Camel
3	Dick Allen	Junkers J10
4	Dennis Richardson	Bristol Scout
5	Jim McKeown	Nieuport 28

MISSION

Place	Contestant
1	Bob Brodeur
2	Barry Couchman
3	Harry Peters
4	Joe Melchiorre
5	Ken Hall

COMBAT

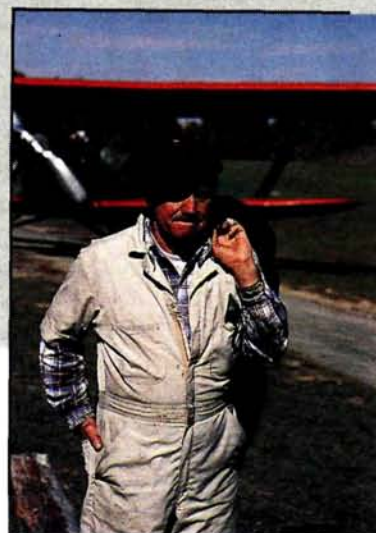
Place	Team
1	Nick Zirola Sr./Nick Zirola Jr.
2	Bob Brassell/Lewis Schwab
3	Dave Baron/Dan Luchaco

event alone, and remember, this is only a two-day meet!

In the Maneuvers competition, the fliers perform a series of 15 mandatory maneuvers for score. This could be considered a type of "turnaround" pattern event for WW I airplanes.

One of the most popular events, especially among the non-modeling spectators, was the Combat category. This pits two fliers against each other, the objective being to recreate the aerial dogfights of WW I. Competitors are judged on scale speed, accuracy and the appeal of their

Pilot purveyor and prince, Cole Palen, prepares for another Black Baron episode.



presentation, as well as originality and creativity. The entire scored portion of the flight only lasts 90 seconds—talk about some frantic activity!

All the competition took place on three frequency-matrixed flight lines, and things moved along quite smoothly with few frequency problems. Engine problems, however, were another matter. I don't know if any temperature records were set during the weekend, but it was incredibly hot, and it soon became ap-



The Morane MS-126 Parasol fires up. Note "human brakes" for improved ground handling.



Cole Palen's 1929 New Standard didn't get much of a rest during the two days of the contest. It was always airborne, giving rides to visitors.

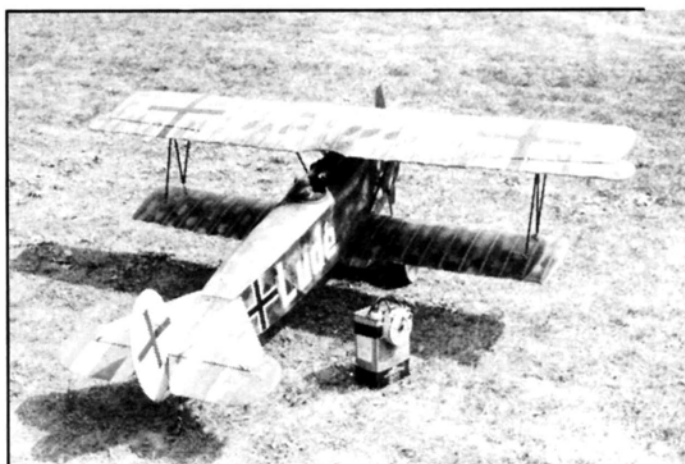


Always a competitor, always a winner, Bud Roane poses with his 3rd-place (giant scale) Thomas Morse Scout. He won the AMA Scale event with his Sopwith Pup.

parent that a number of modelers were having difficulty dialing-in their engines to accommodate the elevated temperature and humidity levels. As for the spectators, they snapped up everything wet and consumable, and the refreshment stands were doing a land-office business!

At a meet that recorded 650 flights, one would expect some casualties. No doubt about it! The Mission event claimed a bunch of airplanes: some were literally snatched from the air by the stick that supported the balloon; others tried valiantly to clear the fast-rising terrain after an approach that was too slow; still others aimed at the spot for landing with the spinner rather than the wheels! We saw giant Taubes go into the trees, disappear and emerge unscathed, but a less fortunate Triplane entered the trees—and remained!

Given that there were only two rounds of flying, some of the combat participants really gave it their



First place in Giant Scale was awarded to Nick Tusa for his beautiful Fokker D-VII. This plane is impressive in the air.



ALL COLE'S VISITORS, BOTH GREAT AND SMALL

REGARDLESS of size, be it 1/4-scale or full-size, plane or person, Cole Palen welcomes everyone and everything at his Old Rhinebeck Aerodrome. Totally out of synch with the dastardly Black Baron character he portrays in the aerial skits, Cole is warm and friendly; he always takes the time to talk with visitors about his field, his airplanes and his flying.

He probably doesn't remember, but four or five years ago, he gave me a hop in his New Standard, along with

AMA VP John Byrne and Coverite's Henry Haffke. Despite my years of flying, it still left a very strong impression. And you know, as I glanced over my shoulder to look at the guy handling the stick and rudder, I saw a helmeted, goggled, white-scarfed Cole Palen smiling the biggest smile I ever saw—truly enjoying what he was doing. He might just be one of the few remaining active aviators of his type!



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89 Supermarine S.6B	\$35	95 Doug. DC-3 (C47)	\$55
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95 Monocoupe Sport	\$36	108 Cor. O2U1/4 L&S	\$56
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55 Lock. 11 Electra	\$30	76 Ford Trimtr 4-AT	\$48
82 Lock. 11 Electra	\$40	114 Ford Trimtr 4-AT	\$65
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81 Stinson T/W SR7	\$26	93 Loening C-2 Amph	\$69
122 Stinson T/W SR7	\$38	58 Grum. J2-F Duck	\$31
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74 Rep. Sea-Bee Am.	\$39	60 Boeing 100 Sport	\$36
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106 Piper J-3 Cub	\$39	72 Northrop Gamma	\$48
98 Lock Hudson Bmb.	\$38	96 Northrop Gamma	\$75
63 Grum F6F Hellcat	\$28	90 Stins "A" Low 3/M	\$56
77 Boeing B-17G Fort	\$35	60 Stins "A" Low 3/M	\$82
103 Boe. B-17G Fort	\$55	120 Stins "A" Low 3/M	\$82
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68 B. Bonanza V-Tail	\$39	65 M. China Clipper	\$65
77 Luscombe Sedan	\$25	97 M. China Clipper	\$75
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RHINEBECK



Part of the scoring and judging area. Uphill terrain in the background claimed a few Mission entrants.



Two members of the team that made it all happen: Contest Director George Buso (left) and Chief of Judges Mike Tebolt.



A Morane Saulnier seeks shelter in the Curtiss hangar. This machine is in great shape!



One of the three active flight lines, this was perhaps the most difficult to fly from, as it was bounded by trees on three sides.

all in the 90 available seconds. The Ziropi team of Nick and Nick Jr. won this event (as it seems they always do!), but not without great sacrifice: a spectacular—and reportedly unplanned—mid-air claimed the giant Taube of Nick the elder.

Although I'd been away for three years, I still found this event offered the fun and excitement I remembered from previous years. It's well-organized, well-attended and one of the few contests around where activities are tied in with full-scale demonstrations. This provides a welcome opportunity for the participants to take a break and become spectators themselves.

Contest Director and old friend George Buso and his great team from the Mid-Hudson R/C Club have done a fantastic job developing a very successful contest format—one that's likely to flourish for years to come. If your schedule permits, mark this one on your calendar. It's a rare opportunity to visit some very pretty countryside, to fly R/C and to see some vintage airplanes recreating history. ■

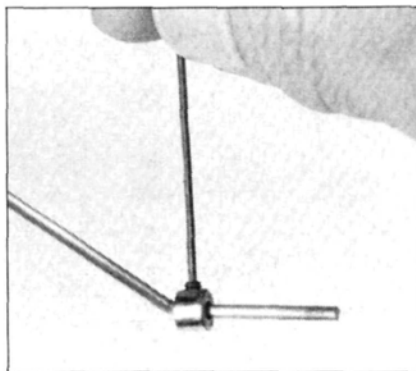
BASICS OF

OF RADIO CONTROL

by RANDY RANDOLPH

THOSE WHO DRAW model plans for magazines and kits must assume a certain amount of expertise on the part of the modeler. For example, complicated scale planes are intended for experienced builders, and the plans concentrate on details of the aircraft itself. On the other hand, drawings for a slab-sided basic trainer usually outline the proper assembly sequence and include information to help beginners. One operation that's almost always omitted, even from basic designs, is mounting wheels to the landing gear.

There are wheel-mounting systems that use cotter keys, clips, wire wrap, drilled axles, threaded axles, notched axles and even peened axles. The most frequently used is the wheel collar; at least, it's the method most often shown on plans. A high-quality

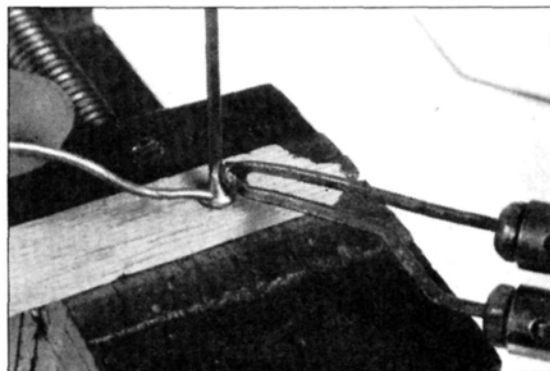


Wheel collars are the most popular wheel retainers.

wheel collar, properly mounted, is a simple way to retain wheels. (The key words here are "properly mounted"!)

Each weekend during flying season, at every active R/C site, at least one airplane loses a wheel. Most of these losses are the result of wheel collars having been incorrectly installed or not checked regularly.

Let's review the proper installation method. First, the wheel collars must be the proper size, i.e., a $\frac{5}{32}$ -inch wire axle must use collars with a $\frac{5}{32}$ -inch hole. (Naturally, the same is true



For the best solder joint, heat the work with the iron and let it melt the solder (rather than melting the solder directly with the iron).

for $\frac{1}{8}$ -, $\frac{3}{32}$ - and $\frac{1}{16}$ -inch sizes.) Most landing gears need two collars—one for each side of the wheel.

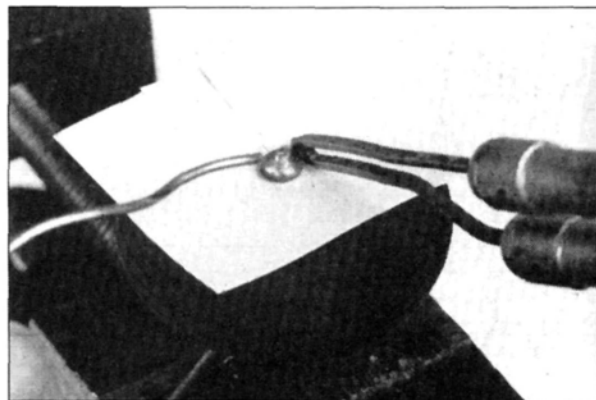
Once they've been located on the axle and the setscrews tightened, remove both collars and file a flat on the axle where the setscrews make contact. This flat should be just wide enough and deep enough for the screws. The collars will be most effective when wheels are mounted this way.

Two other methods of mounting wheels—soldered washers on wire axles and machine screws on gears with aluminum legs—are

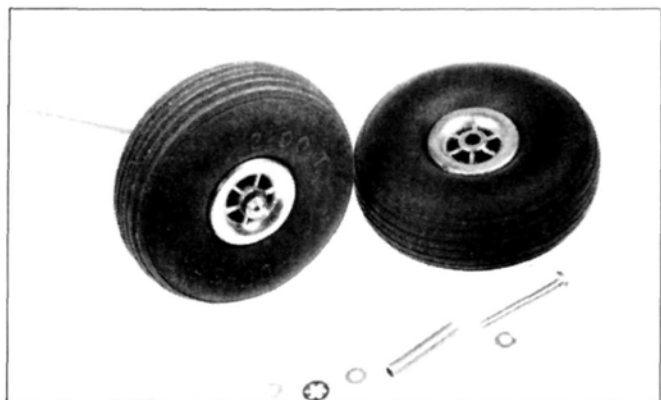
nearly as popular as wheel collars.

Soldering brass or steel washers onto steel-wire axles is probably the most dependable way to mount wheels. That's true only if the washer fits properly and the solder joint is good, however. Obtaining a good solder joint isn't difficult, but it does require preparation, some basic knowledge and a little practice.

Two kinds of solder are readily available: acid core and rosin core. Acid-core solder is designed for joining metal, e.g., washers and axles; rosin-core solder



A piece of bond paper gives the ideal spacing between the wheel and soldered retainer.



Additional hardware is necessary to secure wheels to sheet-aluminum gear legs.



GO, NO-GO GAUGE

Hubless wheels are available in a variety of sizes and styles to fit almost any scale or semi-scale application. The "go, no-go" gauge is an essential part of the system: it dictates the proper wire size for the wheel as well as the axle length. Made by Williams Brothers, Du-Bro and others, these wheels are available at most hobby shops.

must be used for radio and electronic work, but it will work on metal if an acid flux is applied to the parts before they're soldered. Both types of solder, and several kinds of flux, are available at good hardware stores.

Before soldering, clean the axle and washer with fine sandpaper. (If the axle is oily or greasy, wash it.) It's necessary to hold the washer in place on the axle. To make a fixture, in a scrap of 1/4-inch balsa, drill a hole the same size as the axle. Position the first washer and the balsa on the axle so that the balsa is on the wheel side.

When soldering, heat the axle with the iron and let it melt the solder down over the washer; the balsa fixture will prevent the solder from running past it. Using the axle as a punch and the balsa fixture as a backup, punch a hole in a piece of bond paper. Slip the wheel into place, add the bond paper as a spacer, and solder the outside washer into place. When the solder has cooled, remove the paper, and the job is finished!

Mounting wheels to sheet-aluminum gears requires a different approach. Aluminum gears usually come with all the hardware necessary to mount the wheels, but those

furnished in an airplane kit may not. Remember that the wheels should run on a smooth surface, not on the threads of a machine screw.

To mount wheels properly on aluminum landing gears, you'll need this hardware:

- 4-40 (or larger) machine screws that are at least 1/4 inch longer than the width of the wheel at the hub
- lengths of brass tubing that fit the wheel bearing and are 1/32 inch longer than the width of the hub
- metal washers with a center hole that will pass the screw but not the brass tube
- lock washers and nuts to fit the screws.

The assembly sequence is as follows: slip a washer onto the nut, followed by the brass tube, the wheel and another washer. Put this assembly through the hole in the gear and secure it with a lock washer and nut. To finish the wheel mounting, tighten the screw with a screwdriver.

Remember to inspect any type of landing gear before each flying session so that you can correct problems where they *should* be corrected—in the shop! ■

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SPORTY SCALE

TECHNIQUES

by FRANK TIANO

THE MAIL HAS really been rolling in these past few months! Those of you who enclosed a self-addressed, stamped envelope won't be getting a reply; I need the stamps! (Just kidding!) Only the guy who wanted to know the serial number of the Mustangs used in Chile during the Battle of the Beans got an empty envelope!

Some of you sent in newsworthy information and neat pictures that we're sharing. For example, after I mentioned that Don Smith had a super set of Sea Fury plans, Long Island's Roy Vaillancourt sent me a photo of his rendition. It's nice, and the whole plan package costs only \$100. Check with Vailly Aviation* for more scale stuff; most of their models are in the 90- to 100-inch range.

Don't forget R/C Kits Mfg.* and Bob Campbell. After I'd said there weren't



Above left: Seen here on landing roll-out is Bill Carper's P-47 Thunderbolt that's finished to duplicate the full-scale version that was restored by the KalAir Zoo.

Above right: Dave Voglund's P-40E, powered by an O.S. 120 4-stroke; 82-inch span; 16½ pounds.

Left: Amiable, all-around good guy, Charlie Chambers with his F/A-18 Hornet in Blue Angels' markings, built from Yellow Aircraft kit. Word is that Charlie accepted an offer for the airplane that was too good to refuse. He's building another! (Photos by Mike Richardson.)

any new kits around, I got a smoking letter from Uncle Bob with pictures of his entire line, which includes a good-looking 3,000-square-inch Starduster and a 2,000-square-inch, 108-inch Grumman Bearcat. (These wooden kits sell for \$250 and \$300, respectively.) The Starduster uses any 2.4-inch engine, while the hefty Cat relies on something in the 3.7 to 5.8 range, or an old

Buick V8 if you have one lying around!

PHOTO PROTOCOL

I really get excited when you take the time to mail me photos for my column. I'm disappointed, though, when you have great exposure, focus and depth of field, but your slick airplane's sitting in crabgrass that's 8 to 10 inches high! Come on! Find a putting

green, a vacant parking lot, or even a relatively empty, flat, dirt field. The Colonel and I agree: people's legs, car-filled streets and lumpy bedsprads all but prohibit us from publishing pictures of your latest modeling efforts. But please, keep those cards, letters and pictures coming! Mike Richardson's photos, shown above, are examples of the kind of stuff we'd like.



R/C Kits Manufacturing's 1/3-scale Starduster might be just the ticket for scale enthusiasts who prefer large bipes. It's nearly 3,000 square inches!



The Hawker Sea Fury: Roy Vaillancourt's exciting new fighter designed for 3.4- to 4.2-cubic-inch engines; 90-inch span.

LATE ARRIVALS & HAND-LAUNCHED JETS

Yellow Aircraft* jumped the gun a bit in advertising its newly acquired Bert Baker kits of the P-47, the Zero and

(Continued on page 30)

SINGLE-POINT COWL-MOUNTING METHOD

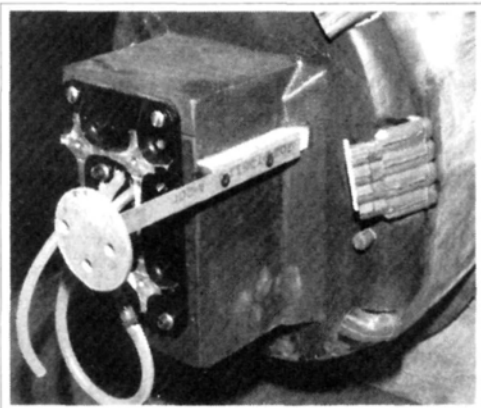


Photo shows detail of single-point dummy-engine installation method described in text. Note simulated-weld bead stiffener on dummy exhaust stacks.

This month's "how-to" is a safe, secure way to mount a one-piece radial-type cowl to a fuselage, using only one bolt. Mike Bacon's terrific sketches should help clarify my explanation: remember, the top view assumes you have a tank or a motor box built into the fuselage that extends out from the fire wall.

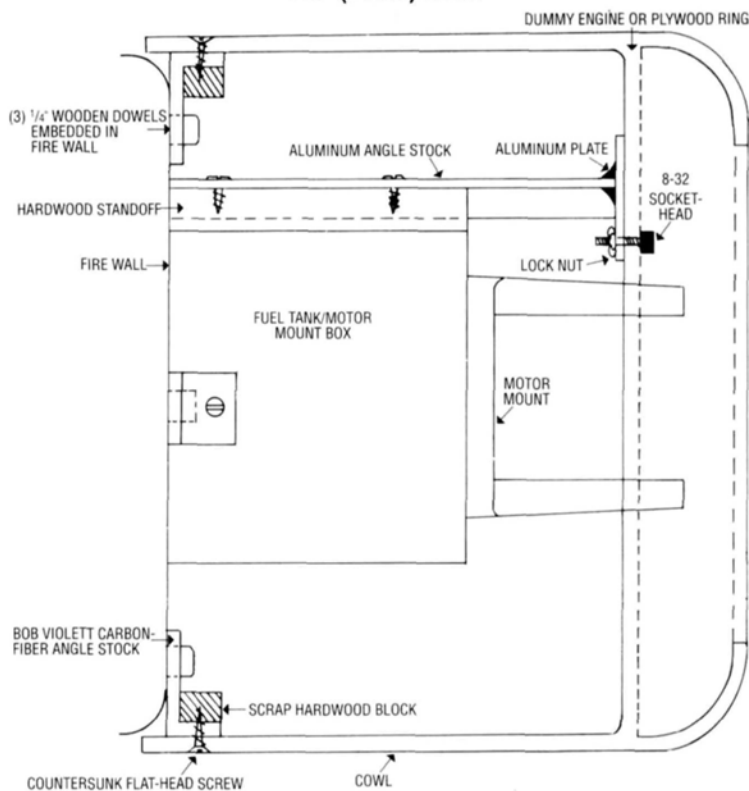
First, attach a backing of $3/16$ -inch plywood to your dummy engine, and use fiberglass cloth and resin to install this assembly in the cowl at its proper location. If you're not using a dummy engine (as in a Focke Wulf or Sea Fury), glue in a $3/16 \times 3$ -inch plywood ring instead.

Next, drill a $5/32$ -inch hole through the dummy engine, approximately 4 inches out from the center, at the 3 o'clock position. Weld a $1/8$ -inch piece of aluminum plate across the front of a firm piece of aluminum angle stock (1x1 inch works well). Mount the aluminum angle stock (or rod) to the front of the aircraft so that the $1/8$ -inch plate touches the rear of the plywood disc, which is epoxied to the back of your dummy engine.

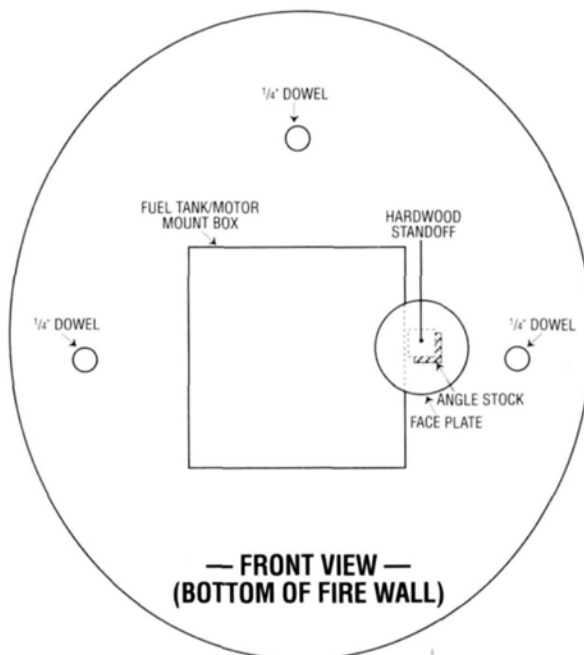
Drill through the $1/8$ -inch plate through the hole in engine's front, and everything should line up! Drill and tap the hole in the aluminum plate (for an 8-32 bolt) or weld a locknut to the back of it. The cowl is held in place by one bolt, which runs through the front of your dummy engine into the threaded aluminum plate.

We haven't finished yet. Flex-Zap three or four Bob Violett carbon-fiber right-angle mounting brackets to the perimeter of the cowl in the area of the flaps (where the inside rear of the cowl meets the forward fuselage). Fiberglass these brackets into place so that their surfaces rest against the forward fuselage bulkhead or fire wall, and drill through them into the fire wall. (Start with a $1/8$ -inch drill and gradually work up to a $1/4$ -inch.) Zap a short length of $1/4$ -inch dowel into each hole

TOP (PLAN) VIEW



DRAWN BY MIKE BACON '90



— FRONT VIEW —
(BOTTOM OF FIRE WALL)

to key the cowl into place around its circumference.

Once the cowl has been fastened to the aluminum standoff with the 8-32 bolt, it can't move! Denny DeWeese has used this method on his Skyraider with fantastic results, and I don't think it can be improved in any way!

READERS' REPORTS!

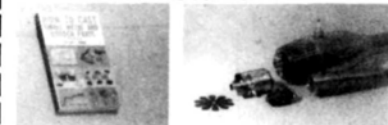
MAKE YOUR VIEWS KNOWN!

We'd like you to participate in our "Readers' Reports" program, which was established to give you an opportunity to voice your opinion on products you've used. The guidelines are easy: Just send us a brief 3 or 4 paragraphs and a picture or two of any kit you've built or have under way. Tell us what you thought. If we use your report with one of our regular "Field & Bench" reviews of the same product, we'll award you a complimentary subscription to MAN. It's that easy. Participate! Make your views known.

Some of the kits now being reviewed:

Ace All Star Bipe
Parkinson Regal Eagle
Global Sport Flyer 40L
Yellow Aircraft CAP-10
Miniature X-Cell 30
Hobby Lobby/Graupner Race Rat
Sig Four-Star 40
O.S. Ryan
Global EZ F-16
Kyosho Electric Mustang
Great Planes Ultra Sport 40
Bonded Roun-Tuit
EZ P-51 Dallas Doll
CGM Freedom 20
R/C Design Weasel
Midwest Electric Hots
Top Flite Phasor
Davey Systems P-47
Lanier Invader
EZ Christen Eagle
Kyosho Stratus 2000

JET ENGINES AND TECHNOLOGY



BLUE BOOK #10
 Small jet engines catalog. Engines, U.S. FOR.
 SPEC' sheets, plans, supplies. 25pp.....\$5.00 \$5.00
THE COMPLETE BOOK OF HOME WELDING
 John Todd, 496 pp., 484 illus.....\$19.60 \$29.95
THE HOME MACHINIST'S HANDBOOK
 Doug Briney, 288 pp., 278 illus.....\$16.60 \$23.95
HOW TO CAST SMALL METAL AND RUBBER PARTS
 William Cannon, 176 pp., 142 illus.....\$9.70 \$13.95
JETS
 Jet builder's monthly newsletter.
 Engineering, construction, shows.....\$12/YR \$15/YR
DOYLEJET
 P.O. BOX 60311-A, HOUSTON, TEXAS 77205
 (713) 440-4744

SPORTY SCALE TECHNIQUES

(Continued from page 28)

the P-38. According to Sir Ronnie out at Yellow headquarters, though, the kits will *absolutely* be ready to ship by mid April.

If you're waiting for landing gear for your Yellow F-16 or F-18, they should be out now. It seems Bob Violett's exact-scale F-16 will be ready to ship around the end of April or early May. The design has already been flown successfully after several hand-launches, and now that the scale gear and struts are ready, it will swing into full production. Word has it that with a stock KBV 72, the F-16 borders on supersonic!

The new Super Tigre 4500 and O.S. 3500 engines should be household words by now, too. I don't know why the Tigre didn't make it to the U.S. back in November, but better late than never!

WISHFUL THINKING?

The rumors about an all-new, super-slick "scale" magazine may not be true after all. The publishers aren't convinced there's enough support to develop a quality, high-tech publication with such a narrow scope. My opinion: give me a high-quality, all-scale magazine with typical MAN color, articles by respected authors, contest coverage that shows us something, at least one major "how-to" article per issue and unbiased product reviews (not just kits or plans), publish it every other month, and I'll pay \$5 for it! If you agree, write Cousin Louis (the publisher) or Colonel Stunning (the editor) and air your views! Show them what a strong force the scale fraternity really is!

COUNTDOWN TO TG II

Top Gun II is only seven or eight weeks away! It looks as if there will be 56 pilots there, eight of whom will compete in Team Scale. There will be many brand-new aircraft this year, too, and the drool factor should be around 9.85! The publishers of MAN, Pacer Technology and the Arizona Model Aviators have pulled out all the stops to all

but guarantee a perfect four-day extravaganza.

In case you think this is too much hype, let me fill you in on just *some* of what and who's going to be there. Of course, reigning Masters champ Bob Violett will be in attendance with an all-new F-86, and at least two other contestants should be fielding BV '86s as well. Maybe we'll get our first chance at a photo of three in formation?!

Earl Aune is coming with his cool Corsair night fighter, and Sir Kemp will be fielding his new B-25. Another B-25 will be entered in Team Scale by Nick Zirola Sr. and Bill Steffes. George Harlan (the builder) has teamed up with Big John Elliot (the pilot) to enter a fabulous deHavilland Rapide. The trip to TGII could be worth it just to see this bird!

We may see the first formation of Skyraiders at this bash, too. Not only will Geno Barton be there with his '89 Masters AD5, it looks as if Denny DeWeese, Diego Lopez and the aircraft's designer, Rick Lewis, will also field 'Raiders. Can you imagine the sight of four 90-inch Skyraiders in formation?

How about the sound of four Webra Bullies flying by? Look for a Charlie Chambers F-18, a George Rose P-38 and a Jack Dorman P-40. Want more? Try a Don Smith Sea Fury, a Jerry Warthan F-4 and a surprise from Bill Hemple (of F-82 fame)! If that isn't enough to at least start a dribble, there will be demonstrations of ducted-fan flying by both Bob Violett and Ronnie Kemp (of Yellow Aircraft). A special treat is in store for us if Don Muddiman of the Cloud Dancers Show Team can make it; his performance with the Flying Machine has to be seen to be believed!

I could go on and on, but that wouldn't leave any mystery. Let's just say that the who's who of scale modeling will be there having a blast fighting for the gold and the bragging rights! Don't forget Top

(Continued on page 59)

SOUTHWEST FAN FLY



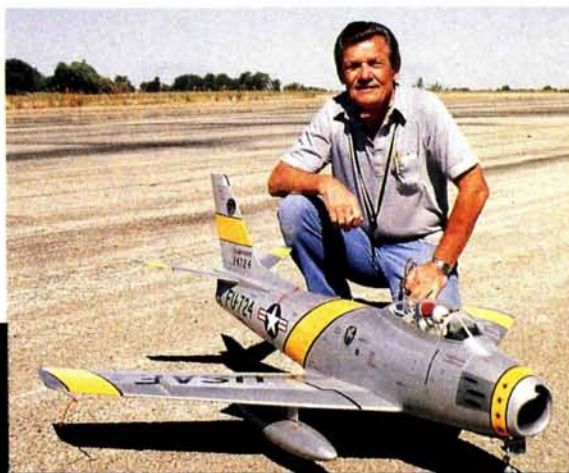
Left: "The BD Fan Club." Left to right: Terry Wyson (BD-5J), Mike Kulczyk (BD-10J) and Tom Sewell (BD-5J). BD-5s are powered by Dynamax/O.S. 77s and built from TNT kits. • Below: A lineup of just some of the F-4s that showed up. Those pictured were all from the Custom R/C kit and had very colorful paint schemes. • Bottom: My nominees for "Best Performance Four Years Running": Co-CDs Dawn Buckley and Ed Couch. These two not only kept things moving, but also flew!



by RICH URAVITCH

I'M A RESILIENT kind of guy; thick-skinned, too. I've developed these qualities since I began my annual trek to the great state of Texas to cover the Greater Southwest Fan Fly. As a Yankee, I'm an automatic target for the Texan locals, but now that I know many of

Right: Dick Rutkosky with his beautifully built and finished Violet F-86 Sabre. Dick loves this plane...and so does Bob Violet! • Below: This unique, well-built BD-10J is the work of Mike Kulczyk, who shows up every year with a new and exciting jet. Jim Bede plans to make the full-scale version of this Mach 1 midget available to the public, but only the well-heeled need apply! • Bottom: Dennis Crooks has the demo flight plan for his F-14A Tomcat really wired, now. Technically, it's one of the most impressive jets around.



OH, THE ROWS OF JETS IN TEXAS...



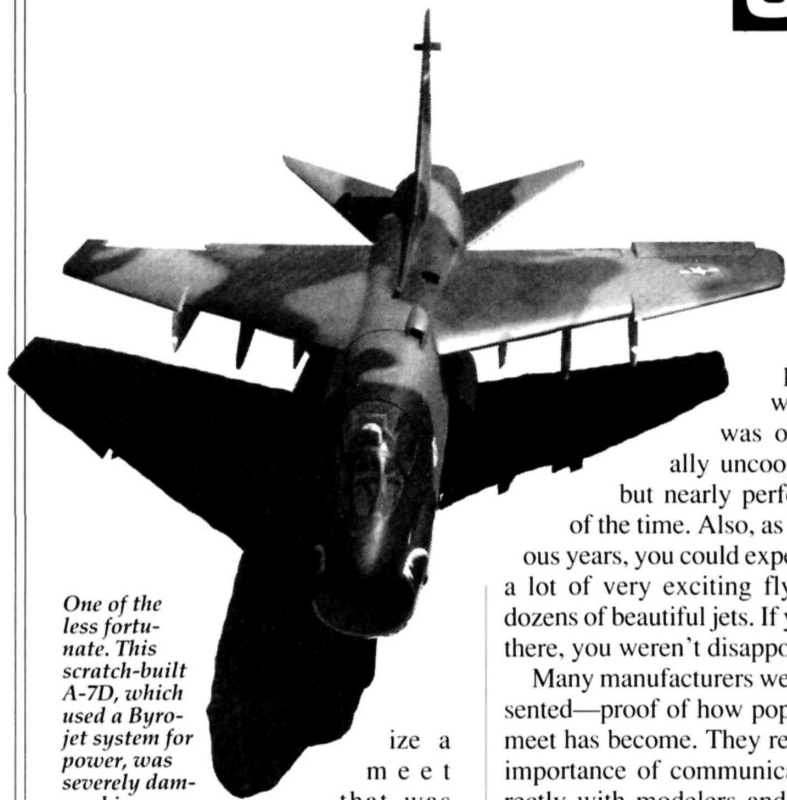
Left: This beautifully detailed Grumman F9F-8 Cougar started as a Jet Hangar kit and was reworked by Don Yockey to accept a Violet fan unit. • Right: A colorful, "civilian" Sport Hawk (a Century Jet kit) was a nice change from the more common military livery.



them, I willingly accept their unbridled abuse.

This adventure began seven years ago with the inaugural event, which took place in Lockhart, TX (a small town not far from Austin). At the time, trying to organ-

(Continued on page 35)



One of the less fortunate. This scratch-built A-7D, which used a Byro-jet system for power, was severely damaged in a crash.

but the guys from Austin said, "Y'all are welcome to come, but we're gonna do it anyway, even if we're the only ones that flah!"

A lot of exciting things have happened in the world of ducted fans since those days, and every year, my calendar is marked, "SWFF, Do Not Miss!" From that beginning, I've seen manufacturers come on board with new, high-performance products, and throughout the country, I've watched the ranks of fan fliers grow faster than any other specialized group in R/C. The fan flies that are held throughout the year in various parts of the country demonstrate this widespread interest. Fan fliers owe a lot to the people who started it all, and I think those people feel an obligation to keep the ball both rolling and growing.

This was the fourth consecutive year that the event was held at the same location (Copeland Field, just north of Ft. Worth), organized by the same two clubs (Greater Southwest R/C and Mid-Cities) and CD'd by the same dynamic duo (Dawn Buckley and Ed Couch). "Never change a winning combination" couldn't be more true. As

was the case in the past, the weather was occasionally uncooperative, but nearly perfect most of the time. Also, as in previous years, you could expect to see a lot of very exciting flying and dozens of beautiful jets. If you were there, you weren't disappointed.

Many manufacturers were represented—proof of how popular this meet has become. They realize the importance of communicating directly with modelers and demonstrating just how good their products really are. I don't think I'd be far off the mark if I said that nearly everyone in the fan business was there, and you can bet that the fliers appreciated it. Among the first-timers: Pat Grubb of Spirit Models* with his F/A-18 and F-16; Bruce Sanders of Century Jets* with his production Sport Hawk and prototype F-105; George Miller of Custom R/C* with his F-4; and Tom Sewell and Terry Wysong, who have formed TNT Models* to market their Dynamax-powered BD-5J.

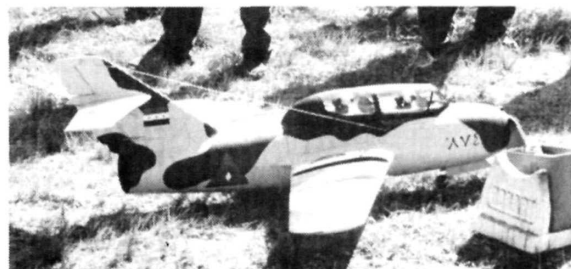
Performance levels keep going up, and the Vipers and Aggressors (Bob Violett Models* flown by Jerry Caudle, Terry Nitsch, and Bob himself) continue to set the pace. Achieving the 200mph mark became routine for these well-guided missiles in some of the downwind passes. It's remarkable that they do it repeatedly—certainly a testament to the engineering and

overall integrity of the product. I've said it before, and I'm more convinced of it than ever: this kind of pure speed performance is always impressive, but it's only for a very small part of the R/C sport fan-flier population.

Closer to my interest and capabilities was the absolutely outstanding F-86 Sabre that Dick Rutkosky of Austin built from the BVM kit. The interior is as well finished as the exterior, with all the attention to detail that Dick could lavish upon it. It's even fitted with a throw-away catch pad to absorb any residual oil! Remarkable!—and it's no "hangar queen," either; he flies it!

Equally remarkable, but now a memory, was the nifty little BD-10J designed and built by Mike Kulczyk. This model featured an O.S. .46 driving a cut-down Viojett rotor. This slippery little jet was flying really well until Mike offered the transmitter to some ham-fisted magazine editor who proceeded to transform the gem back into its constituent parts.

Although there was no specific theme to the event, a quick look down the flight line would have one believing it was the year of the



A simple change in canopy and paint scheme can result in a new look. Nice conversion by Lane Crabtree, who added canopy and camo to a Byron MiG-15 to produce the two-place, trainer version.

Phantom. No less than a dozen were on hand, and eight were built from the Custom R/C kit. Of these, the

SOUTHWEST



My favorite F-4—Rufus Nowak's Rhino—attempts an extremely low, knife-edge pass. Unfortunately, the L.H. gear induced assymetrical drag, causing the nose to touch the tarmac, but the damage appeared repairable.

one that really caught my eye in terms of space utilization was built by Mike Smith of Deer Park, TX. In the fuselage space (normally occupied by a Byrojet* fan unit), Mike managed to shoehorn in a pair of Dynamaxes*! Absolutely no shortage of thrust here!

As long as we're on the subject of F-4s, I must cast my vote for the nicest, most accurately finished version built by Rufus Nowak of Pasadena, TX. His "D" model was built from the Jet Hangar Hobbies* kit, and he used the newest, "lo-viz" gray, "Hill One" scheme with Texas Air Guard (naturally!) markings. It was later damaged on a hard "arrival," but I'm sure it will be put back into shape.

Rounding out the Rhino complement were the "E" models of Ronnie Kemp and Dennis Crooks that were built from the Yellow Aircraft* kit. Airborne much of the time, Dennis only parked his to make frequent flights with his F-14 Tomcat—one of the most impressive jet models anywhere.

Attrition seemed to favor the scratch-built models as Ed Couch's A-10A, Lynn McCauley's F-104, Mike Kulczyk's BD-10J, and a pretty A-7D all became either rebuild or start-over candidates. Exceeding even those criteria in terms of total destruction was Tom

Blatney's F-15 Eagle—an exercise in expansion and contraction. The expansion occurred when Tom scaled up the Ziroli* plan about 20 percent and used a Turbax I; the contraction occurred when, for some unknown reason, at stage center and in full view of everyone, the little Eagle pitched over from about 50 feet and tried to bore its way to China; the first—and final—impediment was the runway! I've never seen so many itty-bitty pieces! Crashes like this are fortunately infrequent, and most fliers managed to go home with what they brought.

This edition of the SWFF was the best one yet in terms of attendance and new things to be seen. At the midday lineup, I counted over 100 airplanes in the middle of the runway, with others uncounted in the pit area. At times, spectators were three and four deep, and things were kept moving. It's a fan event not to be missed, and I'll let you in on a secret—the site is so good that it

looks as though it will be used this year for the Fan Fly (September 16 and 17) and for the Scale Masters finals (September 21 to 24). Two back-to-back weekends with my buddies in Texas. Say hallelujah!!

**Here are the addresses of the manufacturers mentioned in this article:*

Spirit Models, 9255 Survey Rd., No. 12, Elk Grove, CA 95624.

Century Jet Models, P.O. Box 111, Rantoul, IL 61866.

Custom R/C Aircraft, 249 Robin Way, Santa Rosa, CA 95407.

TNT Models, 4183

Travis Country Circle, Austin, TX 78735.

Bob Violett Models, 1373 Citrus Rd., Winter Springs, FL 32708.

Byrojet; distributed by Byron Originals, P.O. Box 279, Ida Grove, IA 51445.

Dynamax; distributed by Jet Model Products, 304 Silvertop, Raymore, MO 64083.

Jet Hangar Hobbies, 12130



This little Pusher .049-powered Northrop B-2 got everyone's attention, but the wind prevented it from being flown at the meet. The designer/builder was stealthier than the subject...I missed his name!

G. Carson St., Hawaiian Gardens, CA 90716.

Yellow Aircraft, 11919 Canyon Rd., Puyallup, WA 98373.

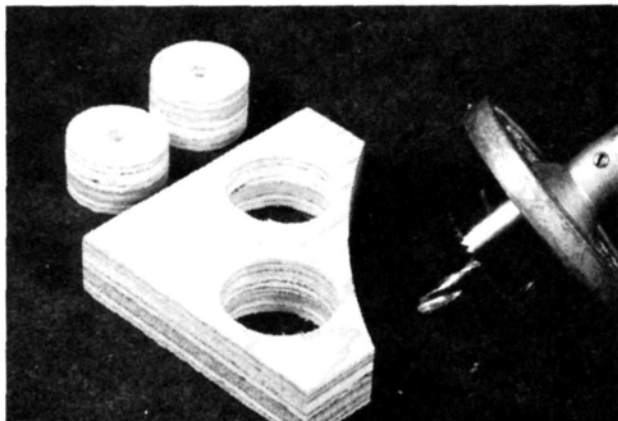
Nick Ziroli Models, 29 Edgar Dr., Smithtown, NY 11787. ■

HOW TO:

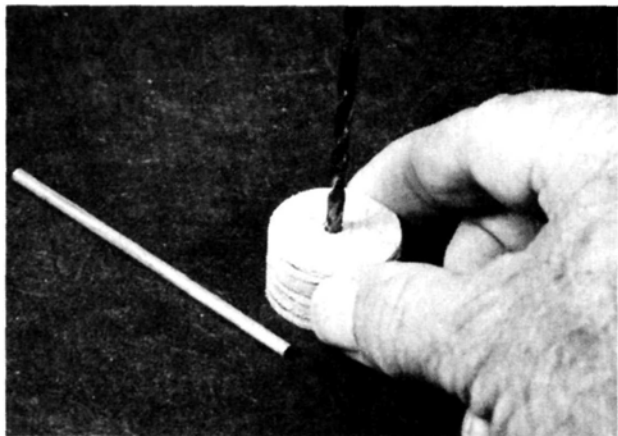
MORE LIGHT WHEELS

by RANDY RANDOLPH

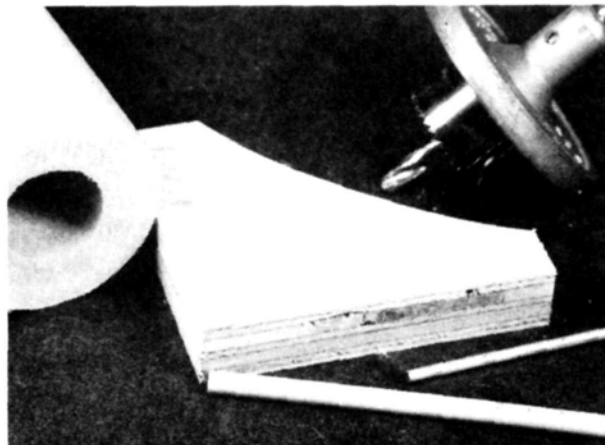
High-grade water-pipe insulation is the basis for these ultralight, 2 1/2-inch wheels. This type of insulation for 1-inch pipe is 3 feet long and comes in packs of four. For less than \$10, there's enough material to make more than 150 wheels! The total weight of both wheels is approximately 1/2 ounce. The photos show the way.



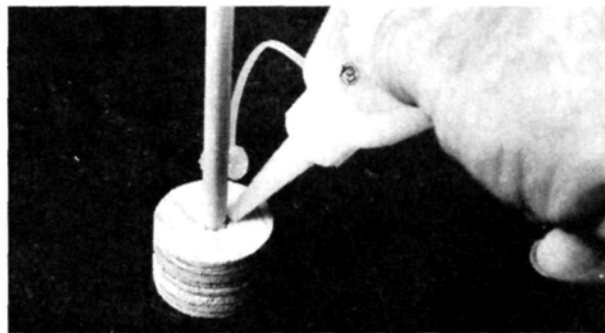
2. Use the hole saw to drill two holes in the plywood. Save the wooden donuts: these are the wheel hubs. If you want to save more weight, you can substitute 3/4-inch pine for the plywood.



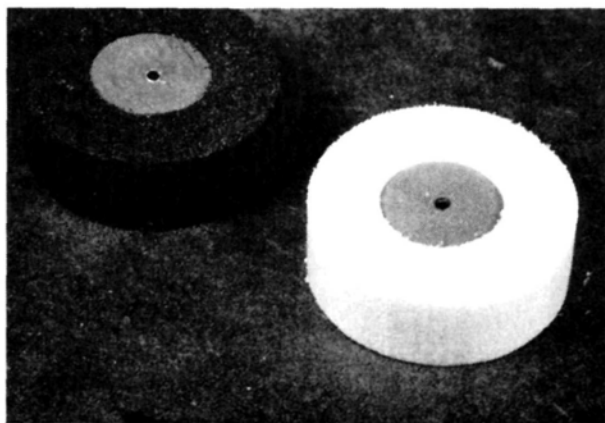
4. With a drill bit of the same diameter as the brass tube, drill the center of the dowel. Drilling exactly in the center is a little difficult, but if the hole is slightly off-center, it won't matter.



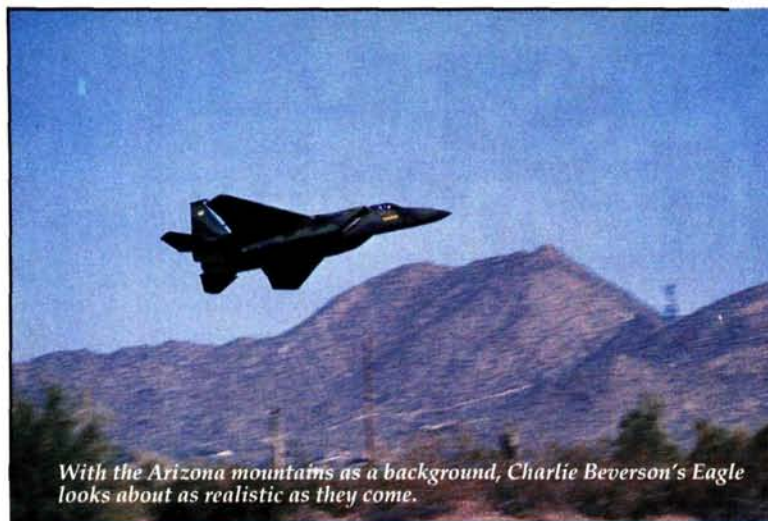
1. The necessary materials include the insulation, a scrap of 3/4-inch plywood, a 1 1/2-inch hole saw, a length of 1/4-inch hardwood dowel and a length of brass tube, the inside diameter of which should fit your axle.



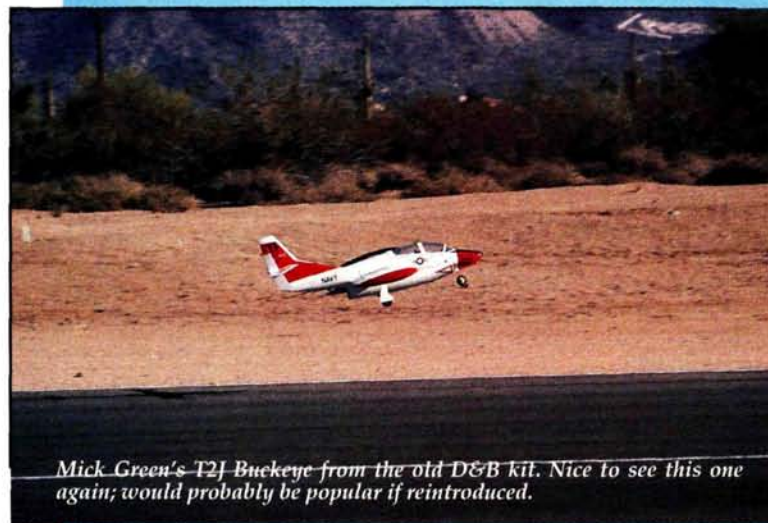
3. Glue the 1/4-inch hardwood dowel through the center of each hub. Leave a little sticking out on both sides, so it can be sanded flush with the sides.



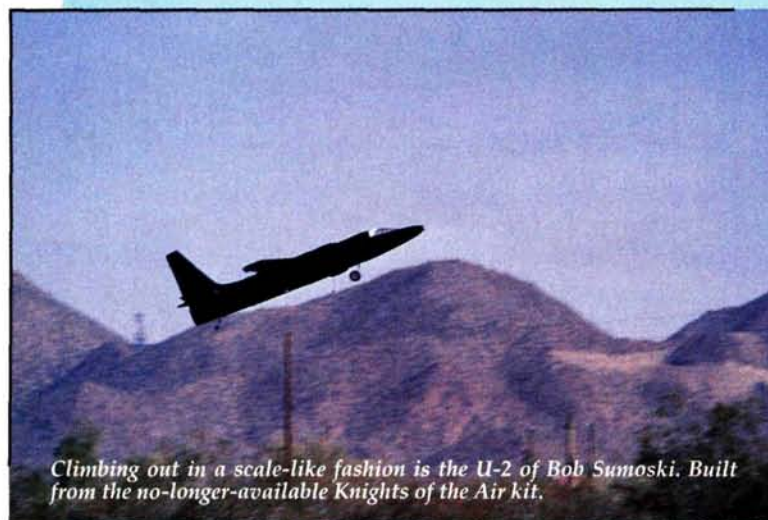
5. Paint the hubs to match the airplane, then slice two, 1/4-inch-wide tires from the insulation. Use epoxy to close the partial seam and to attach the tires to the hubs. The tires can be painted with epoxy paint before they're attached to the hubs.



With the Arizona mountains as a background, Charlie Beverson's Eagle looks about as realistic as they come.



Mick Green's T2J Buckeye from the old D&B kit. Nice to see this one again; would probably be popular if reintroduced.



Climbing out in a scale-like fashion is the U-2 of Bob Sumoski. Built from the no-longer-available Knights of the Air kit.



Headed for a straight-ahead touchdown, just to the left of the center line, is Bob Ruff's Royal Cessna Citation. It sports a pair of RK-20s.

by STEVE GURLEY

NOTHING to do with Halloween, Spook Hills is a beautiful flying field that boasts a 600-foot paved runway that accommodates even the longest takeoff rolls. Held last year on November 18 and 19, and sponsored by the Arizona Model Aviators, the Arizona Jet rally was the first jet-fly invitational to be held there. In perfect weather, spectators crowded the stands, as 35 pilots put over 50 ducted-fan jets through their paces. More than 30 manufacturers sponsored the event, and eight displayed their products during the two days.



The crowd of about 4,000 responded enthusiastically when asked to vote for the best model. The jets were lined up on the runway so that they could get a good view, and pilots from Arizona and California stood by to explain construction and finishing details.

The speed trials showed top speeds of more than 170mph, but there were few "fatalities" during the two-day meet. The spectacular low-pass, three-bounce crash



Part of the crowd walks the flight line to inspect the jets. Spirit jets F/A-18 in the foreground.

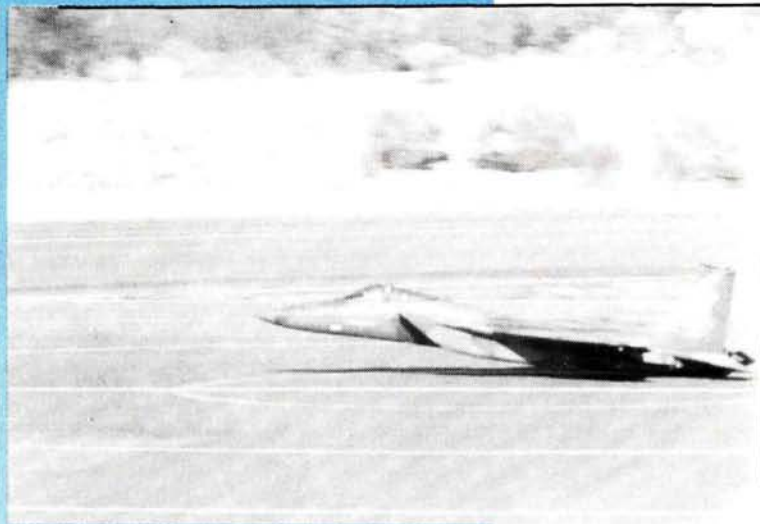
ARIZONA

JET RALLY



"So You Want To Soar With Eagles, Huh?"

Parting shot: Charlie Beverson's ill-fated Byron F-15 Eagle, somewhere between its first and third bounce. Beverson's Eagle just about slowed down. Note fractured canopy parting company in upper center of the photo! \$\$\$\$\$\$!!!



of Charlie Beverson's beautiful Byron F-15 brought the crowd to its feet, and, unfortunately, the damage was extensive.

This event is typical of many local meets that are scheduled for the growing number of jet enthusiasts. I hope there will be many more and that they will be as successful as this one. ■



We should all be this fortunate! The Spook Hill flying site of the Arizona Model Aviators. Some of us will be; this is the site for Top Gun 1990.

ARIZONA MODEL AVIATORS JET FLY PILOTS

Bob Sumoski	Knights of the Air U-2
Ken Taylor	Byron F-16
Bob Ruff	Royal Cessna Citation
Harry Wood	Byron F-16
Brian O'Rourke	Violett Aggressor
Mick Green	D&B T-2 Buckeye
Dave Litt	Midwest Jetster
Paul Steinberg	Paul's Flying Stuff F-86
Andy Yovanovich	F-86
Dorian Anderson	JHH F-4 Phantom
Ron Young	Supersonic Predator
Dennis Roeper	Byron F-16
George Nessline	JHH Cougar
George Kurtzman	Violett Sport Shark
Bill Wendt	Modified Enforcer with Byron Fan unit
Charlie Beverson	Byron F-15
Ken Thornton	Byron MiG-15
George Miller	Custom R/C F-8 Crusader
Pat Grubbs	Spirit Jets F-16 and F-18
Steve Korney	Cobra with Hurricane Fan
Dave Reichart	MiG-17
Col. Bob Thacker	F-4 Phantom

new england

DUCTED-FAN

by RON FARKAS



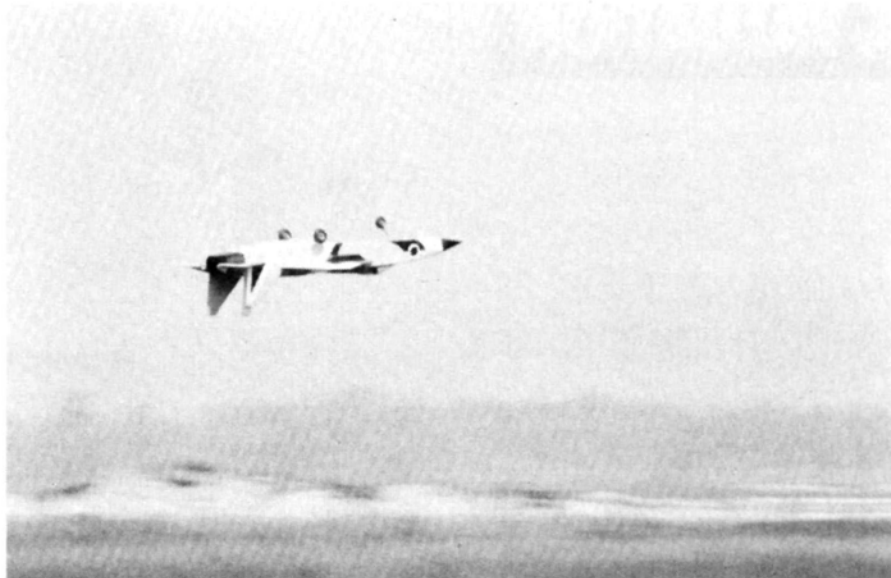
Clockwise from top: Jay Saks' Viper and Aggressor, both with KBV .72 engines, are fast sport fliers. Ramon Feliciano's attractive Byron F-16 was quite aerobatic and realistic on low flybys. Art Arro's 10-year-old Violett A-4 Skyhawk flies well on a K&B 7.5 engine. Jim Werst's P-80 is from an early Sterner Engineering kit; a Rossi .81 in a Byron fan made it a mild, stable flier. Redesigned version will be available soon from Nick Zirola Models.

ON THE WEEKEND of September 9 and 10, 1989, the Mohawk Valley Modelers' club firmly established New England as jet country, as 34 pilots with 39 aircraft flocked to the first annual New England Ducted-Fan Fly. The field was

alive with activity for what must have been two of the hottest September days in northern Massachusetts! The 90-degree temperatures didn't deter spectators, however; they showed up in droves and caused a gridlock as everyone tried to get to the hamburger truck!

Although Event Director Dwight Aube can't take credit for the weather, he can definitely be commended for good planning and a great choice of flying site. We flew from a closed runway at Orange Airport, a small, general-aviation facility. At either end of the strip was an active runway with the usual busy weekend traffic. Flagmen with air horns warned pilots if their models went too close to the full-scale activity. Announcer Harvey Thomasian monitored the airport Unicom frequency on a handheld transceiver. Not only was the whole operation very safe, but whenever there was a lull in jet activity, Harvey kept the spectators informed of the comings and goings of the Cessnas and the Wacos.

Everyone likes scale jets, most prefer them really fast, scale or not, and some like them to be aerobatic, too. The New England Ducted-Fan Fly featured plenty of each. I know that I didn't see every airplane, but I did tabulate the following array of models: from Byron, one F-15, four F-16s, two A-4s and two F-18s; from Violett, two Aggressors, two Vi-



Vince Calano kept going around and around, inverted, getting lower on each pass!

pers and two A-4s; from Parkinson, three Baracudas, two Regal Eagles and a Blue Hornet; three Yellow A-4s and an F-16; four Jet Model Starfires; two Jet Hangar Mirages; a Century Jets Sport Hawk; a Sterner P-80; a Miller F-4; a Zirola plan F-15; a Thorpe plan F-20; and an original-design Thunder.

Art Arro's 10-year-old Violett A-4 Skyhawk flew very well, even though

and updated engine components for more power. The model has had a few complete paint jobs, and Art said that he's put more than 200 flights on it. The newer Skyhawks from Yellow Aircraft and Byron seemed to have a performance edge, but they were running O.S. .77 and Rossi .81 engines, respectively.

With its screaming engines and beautiful McDonnell-Douglas demonstrator color scheme, Bob Barkowski's new Byron F-15 Eagle was a real show-stopper! Although it wasn't the fastest of jets, it looked magnificent in the air, and Bob flew it very smoothly. This model received the Pilots' Choice award in the scale category.

Richard Dunn and Lou Lugero each brought a brand-new Byron F-18 Hornet, powered by the latest O.S. .91 engine. Richard's was finished in Blue Angels livery, while Lou's had gray "lo-viz" operational markings. Neither model had been test-flown before the meet, so they were held until the end of Saturday's official flights. Richard had engine trouble, but Lou trimmed out his F-18 and flew some more on Sunday; it looked great!

Tim Farrell flew a Parkinson Blue Hornet that was also done up in production F/A-18 colors; it showed what can be accomplished with scale detail. One

(Continued on page 59)



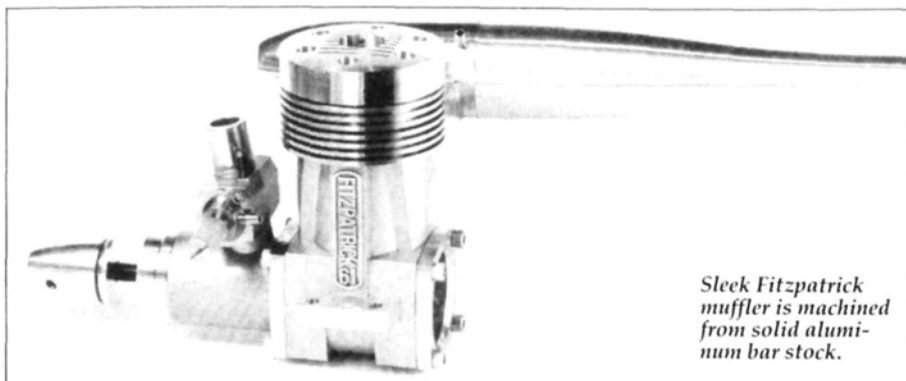
Event Director Dwight Aube relaxes for a moment in front of the operations tent. The sign shows the names of the sponsors who donated merchandise.

its powerplant is only a K&B 7.5. (Several years ago, this was the engine of choice.) Art has made some improvements, including a center-body fairing

ENGINE EVALUATION

A new powerplant as
American as apple pie

FITZPATRICK .61



Sleek Fitzpatrick muffler is machined from solid aluminum bar stock.

by Mike Billinton

AFTER A LENGTHY wait, it's all systems "go" with the Fitzpatrick* 61 Sports aircraft engine. Charlie and Mike Fitzpatrick have ensured that their new product reflects the time taken over its development and their desire to produce an engine that meets, or exceeds, the highest standards in the market. The 61's construction and finish also reflect the successful speed C/L career of these well-known West Coast constructors.

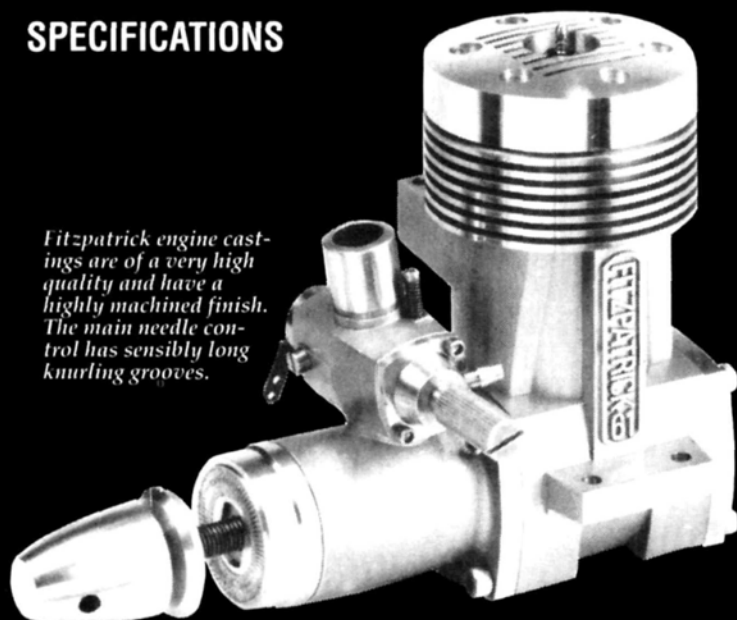
COMPETITIVELY PRICED?

If the Fitzpatrick pair ever put as much effort into making an out-and-out pattern motor (or some other class of *racing* engine) the result should be quite something! They've sensibly made this, their first serious, commercially competitive engine, one that fits the wider "sports" market, and I can't deny that the 61 is almost *too good* for most usual sport uses.

The production delay was caused by the need to get the workshop machinery

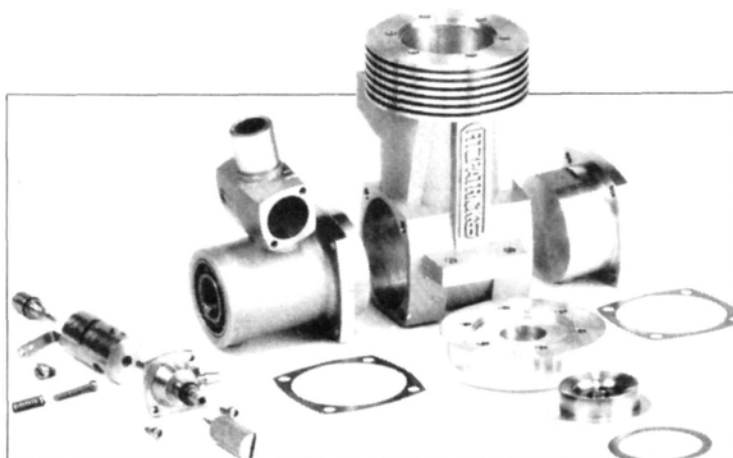
SPECIFICATIONS

Fitzpatrick engine castings are of a very high quality and have a highly machined finish. The main needle control has sensibly long knurling grooves.

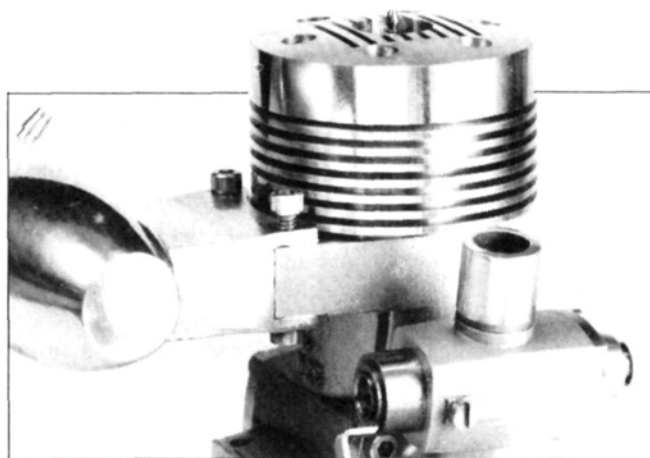


Capacity	.....6106 cubic inch (10.007cc)
Bore	......9432 inch (23.96mm)
Stroke	......874 inch (22.21mm)
Stroke/Bore ratio	......927:1

Timing Periods	.....Exhaust:154°
	Transfer: 110° (angled up 60°)
	Boost : 104°(angled up 60°)
	Front Induction: Opens: 33° ABT
	Closes: 56° ATB
	Total Period: 20
	Blow-down: 22
Combustion volume	.....94cc
Compression ratios	.....Geometric: 11.64:1
	Effective: 8.4:1
Exhaust-port height	......266 inch (6.76mm)
Cylinder-head squish	......012 inch (.30mm)
Cylinder-head squish angle	.....17°
Squish-band width	......160 inch (4.07mm)
Carburetor bore	......370 inch (9.4mm)
Crankshaft diameter	......590 inch (15mm)
Crankshaft bore	......391 inch (9.94mm)
Crankpin diameter	......234 inch (5.96mm)
Crankshaft nose thread	......242 inch x 28 TPI (1/4 UNF)
Wrist-pin diameter	......234 inch (5.96mm)
Connecting-rod centers	......1.673 inch (42.5mm)
Engine Height	......3.95 inches (100.2mm)



Separable head "button" is used. Cover gaskets are .012 copper. Head gasket is .010 copper. Note the one-piece carburetor and front-housing casting.



Unique Fitzpatrick method of fixing muffler doesn't distort cylinder or case. This superfast bolt-on system has brass "captive" nuts fixed to bottom of muffler manifold.

right, but, judging by this new engine's finish, it was clearly worth waiting for! The new computer-controlled, diamond, turning machines really do a great job.

So how about price? Yes; it's competitive (on a par with the O.S. 61 ABC), but the economies of scale enjoyed by Japanese companies make it difficult for the small Fitzpatrick team to compete. Right now, they prefer to sell directly to consumers—so saving on distribution costs.

DESIGN DETAILS

The Fitzpatrick 61's design follows orthodox ABC Schnuerle lines. The main crankcase casting and the separate front housing are "aerospace" investment castings. The standard Schnuerle transfer passages are wide and have parallel sides with a narrow

boost passage. The brass cylinder has a chromed bore that's honed to size and tapered internally to .003 inch, oversize, at the bottom of the liner.

The ringless piston has a high silicon content, and the resulting "ABC" fit is slightly tight at TDC. For maximum strength with minimum weight, the wrist pin is bored through from each end in the usual way. (The wear shown at the end of the test was above average, so I think the pin's material should be harder.)

The connecting rod has obvious C/L speed origins: it's machined from solid-aluminum alloy with phosphor-bronze bushings and lubrication holes at each end; and it has a crankpin of a smaller diameter, so the sliding velocities between the pin's surface and the rod bush are kept low. This means that the crankpin and the wrist pin conveniently measure the same nominal 6mm.

Width	2.36 inches (60mm nominal)
Length	3.84 inches (97.4mm)
Width between bearers	1.62 inch (42mm nominal)
Mounting-hole dimensions	52x20x3.8mm holes
Frontal area	7.3 square inches
Weight (bare)	21.3 ounces (604g)
Weight (with muffler)	25.4 ounces (720g)
Crankshaft weight	3.1 ounces (88g)
Piston weight	.33 ounce (9g)

Performance:

Max. BHP	
64 @ 18,100rpm	(open exhaust/5% nitromethane)
60 @ 14,100rpm	(Fitzpatrick muffler/5% nitromethane)
64 @ 17,800rpm	(J'Tec muffler/5% nitromethane)
Max. Torque	
8 oz./in. @ 9,200rpm	(open exhaust)
10 oz./in. @ 9,100rpm	(Fitzpatrick muffler)
14 oz./in. @ 9,700rpm	(J'Tec muffler)

Max. on Standard Propellers:

	Open Exhaust	Fitzpatrick Muffler	J'Tec Muffler
14x7 Graupner	8,443	8,279	7,463
13x6 MK (glass)	10,414	10,167	9,947
11.5x10.2 Yoshioka	10,448	10,277	10,057
13x6 Top Flite	10,625	10,489	10,215
12x7 Mastro	10,953	10,565	10,382
11x7 Master	13,032	12,887	12,200
11x6 Graupner	13,720	13,570	12,602
10x6 Master	15,602	15,266	14,577

Performance Equivalents:

BHP/cubic-inch	2.68
BHP/cc	.164
Ounce-inch/cubic-inch	209
Ounce-inch/cc	12.8
Gram-meter/cc	9.4
BHP/pound	1.23
BHP/kg	2.7
BHP/square inch frontal area	.22

FITZPATRICK 61

The two-piece "head-button"-style cylinder head is fitted at a fairly standard geometric compression ratio of 11.6:1, though it has an unusually high squish angle of 17 degrees. The head and cover bolts are all of identical-length, chromed, Allen-bolt style.

The crankshaft has carbon-fiber fill-ins pinned to the crankweb and surrounded by a full-diameter brass ring. This supposedly reduces lower-case volume and thus raises the "primary" compression and increases 2-stroke pumping efficiency. (Many sports engines work effectively without this extra feature.)

The 61's most unusual feature is its combined, one-piece, carburetor/front housing, which guarantees security against air leaks. During the test, it gave very precise, repeatable throttle and needle settings, but the Fitzpatricks, in fact, opted for the one-piece casting because it costs less and is less complicated.

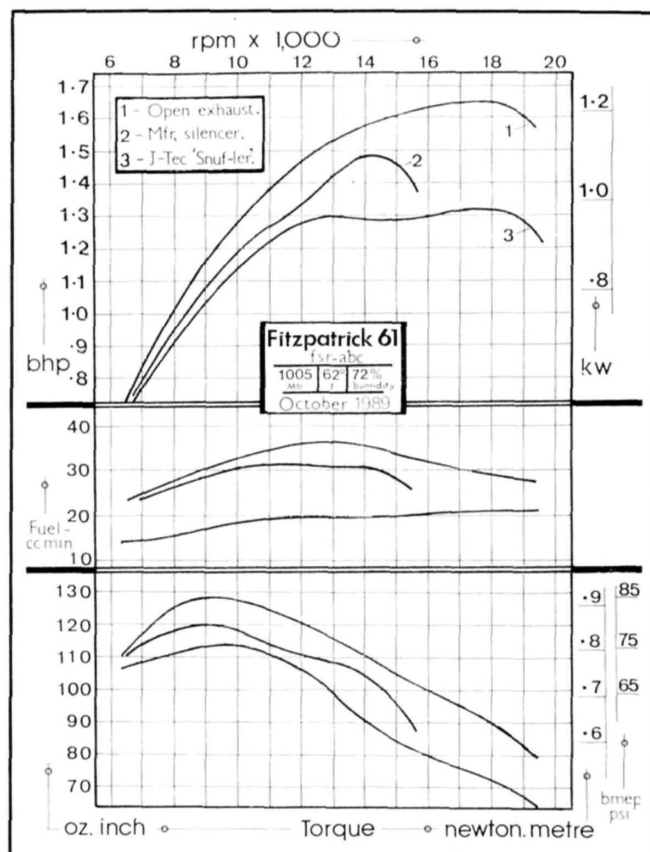
The needle valve operates within two O-rings, and the control over fuel settings that results from this setup was the high point of the test session: the range of 2-stroke settings was more like those on a resistance-controlled electric motor. As a speed-C/L aficionado, I know how Charlie and Mike feel about the importance of needle valves when you're trying to "home-in" on the right setting!

Again influenced by their competition experiences, the Fitzpatricks wisely decided to ensure that their stylish solid-aluminum muffler wouldn't distort the crankcase or the liner in any way. As a bonus, two downward-facing Allen bolts make this muffler the most secure and easy to fit I've ever come across (some muffler-bolt fixings are monster time-wasters!).

Finally, there's an equally stylish propeller spinner nut, and, overall, the Fitzpatrick 61 shows considerable evidence of much careful hand-fitting and finishing.

PERFORMANCE TEST SERIES

Respecting the manufacturers' request that the cylinder-head torque be left alone, all running-in and power testing was completed before the engine was dismantled for measuring, photographs, etc. During and after the running-in period, the rpm of a variety of propellers were checked, and I was struck by the

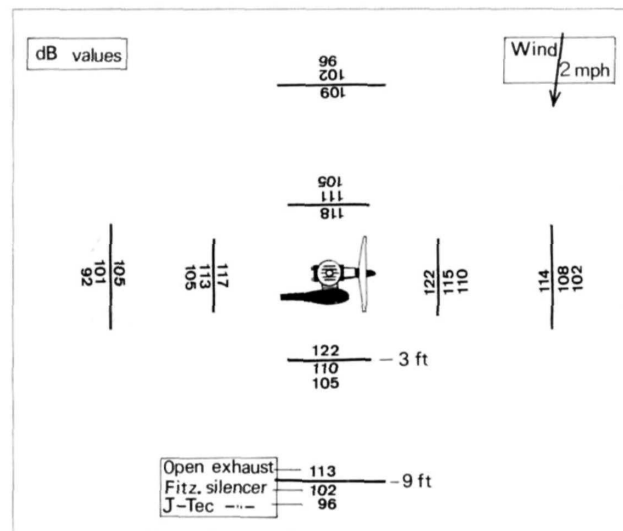


carburetor's ability to provide extremely solid, steady running.

It was also clear that the final, actual rpm levels would put this new engine among the "average" hp producers. Its design has, however, allowed the points of maximum torque to be kept at fairly low rpm, and this makes the engine suitable for a more sedate type of scale aircraft performance than might be supposed from its origins and appearance.

Test 1. Open exhaust. Fuel: 5 percent nitromethane; 10 percent castor; 5 percent ML70 synthetic oil; 80 percent methanol. Idle-bar glow plug, as supplied.

Fuel consumption, torque and rpm were monitored from 6,497 to 19,365, at which high-rpm point fuel settings became some-



SOUND LEVELS - dB

Equipment: Open exhaust/Fitzpatrick muffler/J-Tec muffler

Fuel: 5% nitro/10% castor/5% ML70 synthetic oil/80% methanol

Engine position: 3 feet above hard earth

Temperature: 60°F

Humidity: 88%

Propeller: 11x7 Master

Mean rpm: 12,800—achieved in the various muffler modes by adjusting the throttle

Sound meter: Radio Shack's 33-2050 unit—set horizontally at 38 inches from the ground and pointing toward the nearest sound (whether from propeller, muffler, or open-exhaust outlet) and at two distances: 3 feet and 9 feet

Meter settings: "A" Scale and "Slow" response

what

critical and the engine cut if just slightly too lean. The hp maximum of 1.64 occurred near this high-rpm end—at 18,100. Maximum torque occurred between 8,800rpm and 9,500rpm.

Test 2. Fitzpatrick Muffler. Fuel and plug as in Test 1.

The manufacturers' muffler depressed performance and dB levels rather more than initially seemed likely given the fairly large outlet diameter—.55 inch (14mm.).

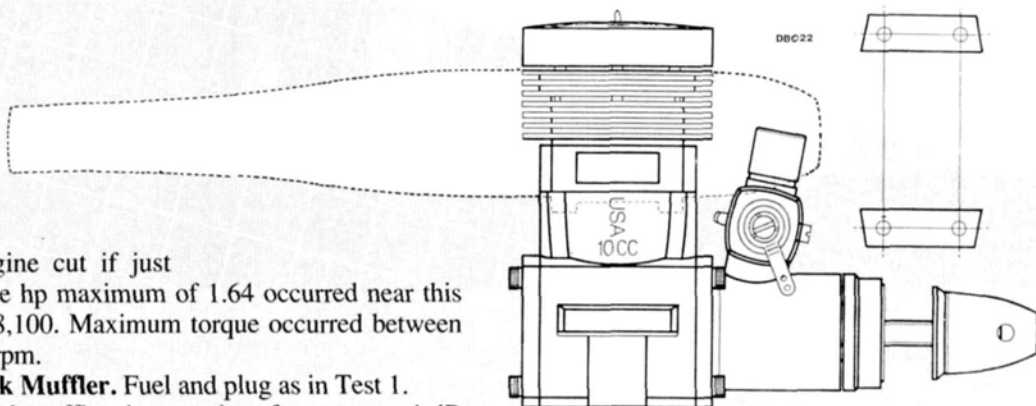
Rpm at the high end were severely restricted, and torque levels swiftly dropped past 14,000rpm. The manufacturers' recommendation of 12x6 propellers for scale models seems ideal for this engine/silencer combo, given the likely 12,000rpm operating area.

Test 3. J'Tec Snuf-ler Muffler. Fuel and plug as in Test 1.

Hoping for additional useful information from this test, MAN Editor Rich Uravitch provided a Tatone add-on muffler. Well, the unit certainly had some effect, because the J'Tec muffler wasn't designed to be retro-fitted to the unusual Fitzpatrick muffler. I solved this slight problem by sawing (desecrating?) the Fitzpatrick unit to allow the two to fit snugly together. (I used a short length of silicone tube as a sealant.)

As the J'Tec muffler was designed to fit a wide range of engine sizes (from .25 to 1.08 cubic inches), its silencing effect (compared with that of a stock muffler) will inevitably be variable, and it's certainly likely to quiet bigger engines more effectively than smaller ones.

Tests on the Irvine 46 and on this engine seem to bear this out. (The Irvine test actually showed slightly more power for the J'Tec than for the fairly restrictive standard muffler.) In both tests, the J'Tec muffler showed a "tuned" effect. For example: in the 61, performance beyond 15,000rpm increased to the point where maximum hp occurred near to the open-exhaust peak of 18,000rpm. This finding is interesting, but of little real value, because the propeller sizes necessary for this rpm range and the associated low torque levels are, for R/C scale purposes, silly—9x6 or less!



Because of the marked noise reduction achieved with this effective, add-on unit, it was no surprise that hp and torque were also appreciably reduced by its use. On the other hand, the reduction in fuel consumption was a welcome compensation for the loss in power.

SOUND LEVELS

Sound levels in the three configurations were measured after the power tests had been concluded. I think a fairer comparison of the mufflers would be achieved by using differing throttle openings to ensure rpm comparability—if using the same propeller for all three. Clearly, the greater open-exhaust power would give higher rpm on a given propeller and would result in greater propeller noise, quite apart from the exhaust/rpm-related sounds. Alternatively, the use of three propeller sizes (to give the same rpm on each style of muffler) would lead to different propeller noise, and this would obscure the actual dB relationship between the mufflers.

IDLING PERFORMANCE

With a muffler, a 11x7 Master propeller and fuel like that used in Test 1, the minimum sensible idling speed was 2,200rpm, and this could only be obtained by using a heavy-element OPS 300 glow plug.

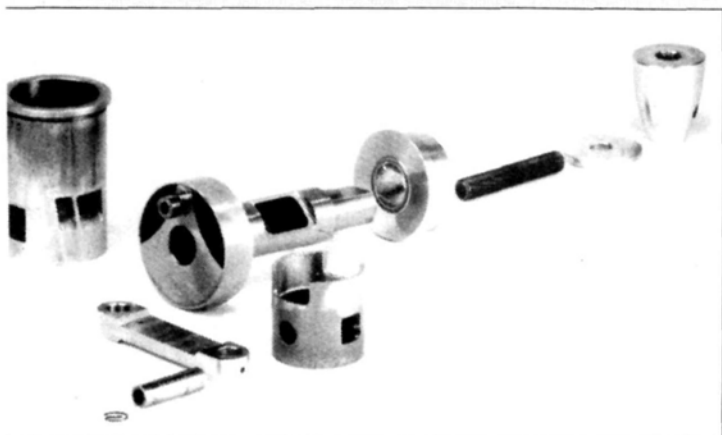
Using the manufacturer's idle-bar glow plug actually produced a less satisfactory idle (with rpm below 2,600), causing the engine to cut—apparently owing to "lack of fire." This has been noted in several engine tests, and it's beginning to acquire respectability as a useful and very inexpensive ground rule, because these thick-element plugs last and last—even under severe racing conditions and with high-nitro fuels. They even operate well in cool-running 4-strokers.

SUMMARY

If the Fitzpatrick 61 engine were being mass-produced, I'd be tempted to say that the USA's fight to match high-quality Japanese imports is succeeding. But the 61's relatively small production runs and direct selling mean that the distribution of this superb .61-cubic-inch sports engine will initially be somewhat limited.

It is, however, reassuring to see what commitment and ambition can achieve. Perhaps production will be expanded? The Fitzpatrick 61 is a fine engine that's certain to give a smooth performance. It isn't the most powerful engine—but I'm certain that *wasn't* the Fitzpatricks' aim.

**Here are the addresses of the companies featured in this article:
Fitzpatrick Engines, 2120 Bentley, 303 West Los Angeles, CA 90025.
J'Tec, 164 School St., Daly City, CA 94014.*

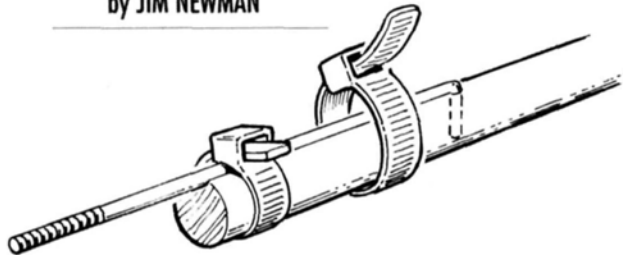


Crank-web segments are carbon-fiber filled and surrounded by brass containing ring. Conrod has three lube holes at each end. Split transfer and single boost ports are shown on liner, while piston has the matching boost port cutaway in skirt.

HINTS & KINKS

Model Airplane News will give a free one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Hints & Kinks." Send rough sketch to Jim Newman, c/o Model Airplane News, 251 Danbury Rd., Wilton, CT 06897. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO, AND NOTE YOU SUBMIT. Because of the number of ideas we receive, we cannot acknowledge each one, nor can we return unused material.

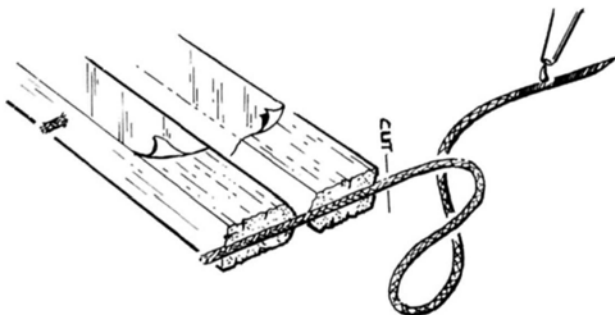
by JIM NEWMAN



SPEEDY PUSHROD ENDS

Instead of using thread and glue to bind wire fittings to his pushrods, our contributor uses nylon electrical ties from Radio Shack. After pulling them tight, he coats the assembly with thick CA.

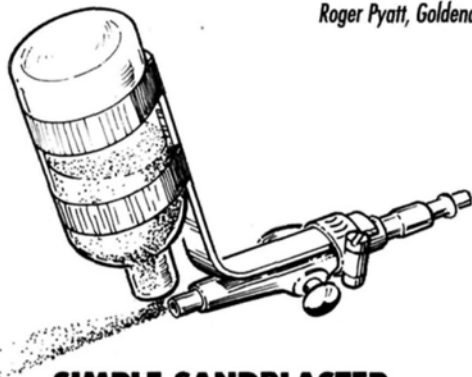
Jack Leslie, Ridgecrest, CA



CORD HINGES

This is a great idea where saving weight is important. Shape and sand the stabilizer trailing edge and the elevator leading edge, then cover them. Roger used Western Filament, 45-pound-test, braided, squidding line, one end of which he stiffened with CA then cut to a sharp point. He then drilled the spars, passed the cord through them and secured each half with CA before snipping off the excess. After hinging, he began to build the tail surface.

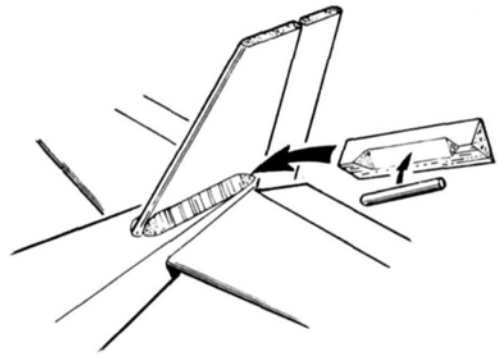
Roger Pyatt, Goldendale, WA



SIMPLE SANDBLASTER

A plastic bottle filled with sand is joined to a metal bracket with adhesive tape, and a hose clip holds the other end of the bracket to an air nozzle, as shown. To operate, invert the bottle of sand and squeeze the nozzle's trigger. Dennis used regular construction sand; it took only two bottles of this to restore an old engine case. *Caution:* mask off all bearing and machined surfaces and wear a safety mask!

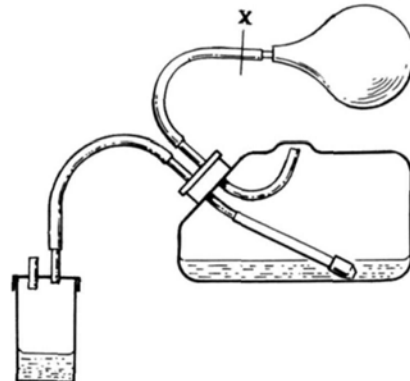
Dennis Patera, Olympia, WA



HIDDEN BALLAST

This builder's model was nose-heavy, and he came up with a novel way to hide the compensating ballast. He recessed the inner face of some balsa triangle stock, then glued lead rod into the area. The triangles were used to reinforce the fin attachment.

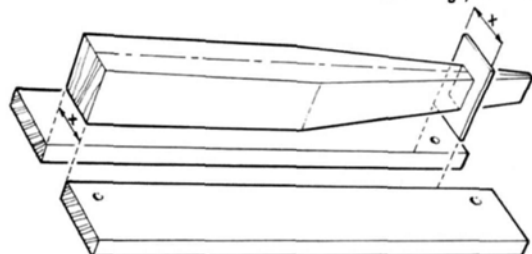
Bruce Sheeran, Landenberg, PA



FUEL-SYSTEM PRESSURE CHECK

On your workbench, pour about 1 ounce of fuel into a tank, attach a Sig-type fuel bulb and pump away. Check to see that fuel is flowing into the overflow bottle, then pinch off the line at X and pinch the overflow vent. Hold this for a few minutes to see if the system retains the pressure; if it does, install the system in the model.

Ed Eldridge, Winter Park, FL



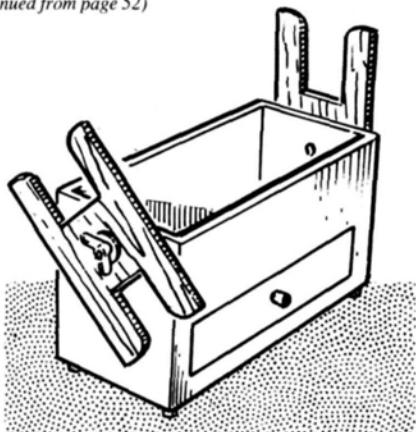
FUSELAGE-CENTERING JIG

This works well with a Black & Decker (or similar) vise. Make a thick card or wooden former to accept the rear fuselage. (Note that the former is of the same outside width as the parallel part of the front fuselage.) Insert the assembly into the vise and gently close its jaws. This centers and holds the rear while you insert the aft formers, then it keeps it centered while the glue sets and you add the top sheeting.

Juan Pablo Movarec, Santiago, Chile

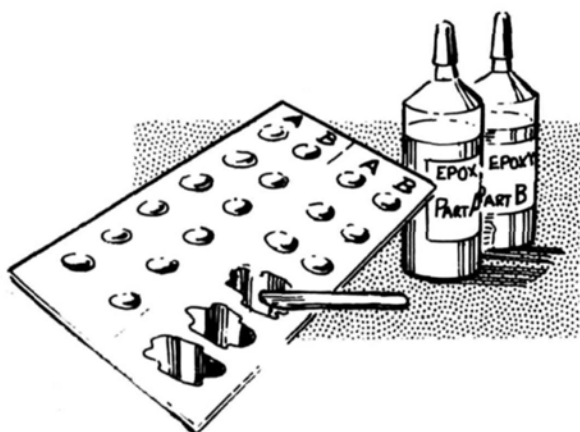
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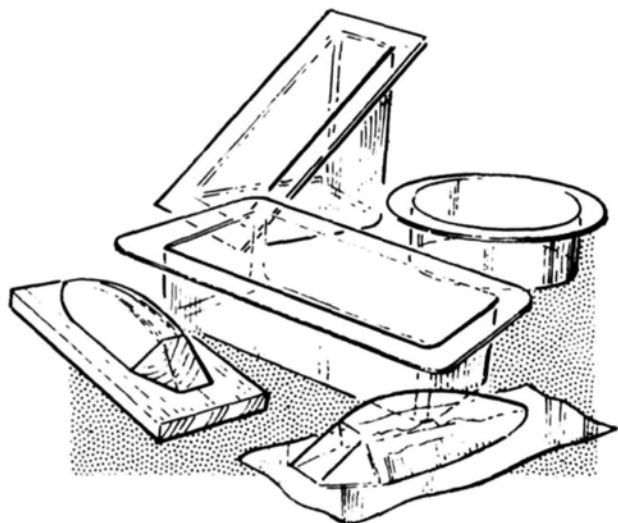
ROTATING MODEL STANDS

Rotating model stands, sized to fit two different models, are attached to a field box with wing nuts. Rotate the stands as required, then tighten the nuts. Use foam tape to protect the model's finish.



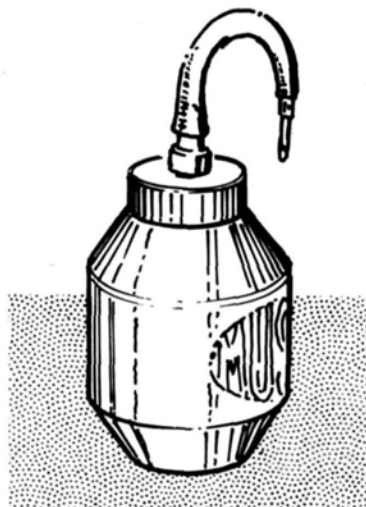
EPOXY PALETTE

When building, keep a palette of very small epoxy blobs on hand. Any number of blobs can be combined as required, and you'll find that this method saves time and eliminates waste.



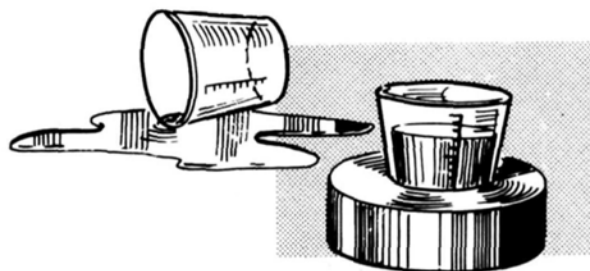
FREE PLASTIC!

Plastic vacu-formed food containers are a useful source of free material for those small vacu-forming units, like the old Mattel model.



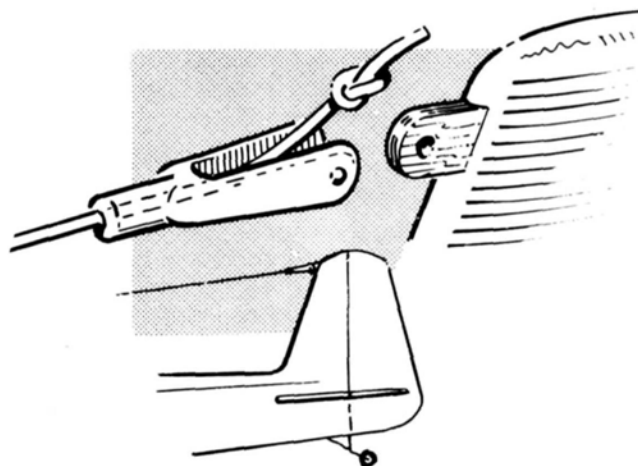
RECYCLED BOTTLES

Clean out those plastic "twist-to-open" mustard containers; they make great, re-sealable fuel bottles.



STABLE MIXING CUPS

Small plastic mixing cups are easy to knock over, but if you set them down in a roll of tape, there's no danger of this.



ANTENNA ANCHOR

This is the neatest antenna anchor yet! Pass it through a clevis, knot the end, and snap it to the fin. Use a tensioning rubber band in the fuselage at the forward end.

SPORTY SCALE

(Continued from page 30)

Gun 1990: read the advertisement in this issue or send a S.A.S.E. to me, and I'll get you all the information on where to stay, where the field is, when the parties are and how to get to the Champlin Fighter Museum! If you can't make it, the next best thing will be to read the Colonel's coverage right here, and to arrange to get to Top Gun III, here in Florida, in 1991.

HELPFUL HINTS

Finally, for those of you who have asked how to contact AeroLoft Designs (the company that makes custom rub-on markings), its new address is 8716 S Roberts Rd. Unit A, Hickory Hills, Illinois 60457, and the phone number is 708-430-7666.

That's a wrap. Next month, we'll have another "how-to" and show you some new products aimed directly at the scale market. I'll close with some advice for newcomers to this wonderful sport:

- Never paint your own chips and expect to do well at a *real* contest.
- Low-pitch props *won't* force your airplane to crash at a lesser angle of attack.
- Battery packs have a memory, but cycling them properly causes amnesia.
- Reheated hamburger grease does *not* make the best fluid for your smoke system; extra-virgin olive oil is a much better choice.
- Squeezing your muffler with a pair of water-pump pliers won't necessarily increase your muffler pressure.
- A water pistol can't be used as a spray gun, even in a pinch.
- Norm Berger's generator isn't efficient enough to recharge your wimpy battery pack as you're flying, no matter what his ads say!
- If you're visiting Fighter Town, FL, and you're driving a MiG, there's no better time to check your six!

**Here are the addresses of the companies mentioned in this article:*
Vaill Aviation, 18 Oakdale Ave., Farmingville, NY 11738.
R/C Kits Mfg., 221 Middlesworth SW, North Canton, OH 44720.
Yellow Aircraft, 11919 Canyon Rd. E., Puyallup, WA 98373. ■



NEW ENGLAND FAN FLY

(Continued from page 47)

of the more impressive Byron F-16s was Ramon Feliciano's: he finished it in Israeli Air Force desert camouflage colors. Its Rossi .81 provided just the right power for a comfortable top speed, and Ramon performed consistently good pattern maneuvers, as well as low flybys. Hal Peters brought another F-16, which was made from the new Yellow Aircraft kit and powered by an O.S. .77 in a Dynamax fan. Saturday's flight got off with a bad engine run, so Hal eventually set it down in the bushes, with only a little fuselage damage. After a midnight repair session conducted by his buddies Todd Thompson and Charley Micha, it was back in the air and flying well on Sunday. Charley is one of those people who just *has* to go fast. His Jet Model Products' Starfire has a new O.S. .91, and on its high-speed passes, the plane was just a red blur!

Stories about repairing airplanes in a motel room are fairly common, but how many of you have heard of repairing a *transmitter* just before heading to the field? That's what Bob Parkinson had to do on Sunday morning. He discovered a chafed spot on the PC board, so he borrowed a soldering iron to jump it with a piece of wire. He flew up a storm with a Baracuda (from his own kit, of course!). This model was powered by an OPS .80 in his Vector fan unit.

Vince Calano and Jim Kraft had a ball with their Parkinson Regal Eagles. This great sport airplane must inspire a lot of confidence: Vince spent much of the time flying inverted down on the deck!

Another flier who put on a good aerobatic demonstration was Greg Garneau from Montreal. Greg's Violet Aggressor II had a KBV .82 engine and was one of the fastest jets at the meet. Its performance and an attractive Aggressor Squadron "snake" color scheme earned it the Pilots' Choice award in the sport category. High marks for speed also went to Jay Saks with his an Aggressor and a Viper, each with a KBV .72 engine.

Ed Dobias brought his scratch-built Thunder, which he designed on a CAD system and built from balsa and foam. It had a 49-inch span, weighed 14 pounds and was powered by an O.S. .91 in a Dynamax fan. Ed finished the Thunder in Blue Angels colors.

Another eye-catching model was Eric May's F-4 Phantom, built from a George

(Continued on page 83)

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FIELD & BENCH REPORT

M I D W E S T

HOTS

II

A NEW, IMPROVED
VERSION OF ONE OF
THE MOST SUCCESS-
FUL FUN FLIERS



by MIKE LEE

OCCASIONALLY, an aircraft that's simply outstanding in its class comes along. Among sailplanes, we had the Paragon; pattern had the Curare; pylon has the Little Toni; and a long time ago, we had the Ugly Stik. In 1984, however, the standard Stik met its match for all-out fun and sport-flying when Dan Santich designed the rip-snortin' Hots. This small aircraft, with its non-removable wing, soon became the sport flier's aircraft of choice.

READER REPORT **HOTS II**

Like so many other classic designs, the Hots wasn't produced in only one size for long. The 60-size Super Hots soon hit the scene, and this was followed closely by the Big Hots, the Hotselliptic—and even a one-off Hots Bipe. But the basic Hots remained the number-one fun-fly choice among R/C flying aces.

It's difficult to improve on a classic design, but Midwest* has done just that with the Hots II—an even deadlier fun-fly aircraft that's easy to transport. Changes and additions include a removable wing, a fully cowled engine, a stronger airframe, wing-tip plates, a larger fuel-tank compartment and generally smoother lines. To top this off, Midwest has kitted the design using its Success Series format, which makes building a breeze!

A HOT KIT

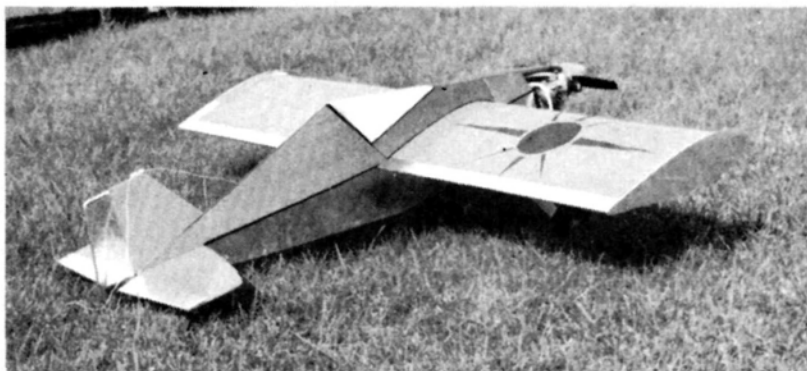
I was immediately impressed with the kit's quality. The die-cutting was really *cut*, not "die-crushed." The fuselage sides, the formers and some other parts are of lite-ply, and they literally fall away from the sheets and need hardly any further preparation. I wondered why Midwest had even bothered to leave the excess sheet material in the kit: it would have been so easy to remove it. The instruction manual is excellent: the Success Series format includes drawings and "check-upon-completion" boxes.

WING ASSEMBLY

Wing assembly comes first, and you start with the spruce main spars. The center section is spliced with an additional spruce joiner, and then the ribs are positioned according to the plan. I put all the ribs onto the spar and *then* hit them with adhesive, which speeds things up. Next, I added the trailing edge, the trailing-edge sheeting, the top spar, the leading edge, the top forward sheeting and center-section sheeting—and that was just about it! I completed the wing in less than 2 hours!

While assembling the wing, I didn't have to trim any part to make it fit. Everything fit to within $1/16$ inch, and I had to cut only the center-section sheeting. I'm impressed!

The wing is reinforced with shear webs and is very strong. The center section is relieved to allow the fuel-tank access to extend into the wing. The method used to install the wing dowels in the center space



by **CRIS HEMINGWAY**
Salmon Arm, Canada

AFTER BEING AWAY from the hobby for about 10 years, I was encouraged to try it again by an associate at work; he was interested in R/C and asked me to help him get going. Needless to say, I again succumbed to the "bug" and started to revive old radio gear, engines and models that had been packed away for a decade! The Hots II is my second new kit since I rejoined the ranks of R/C fliers, and I like it!

The plans were clearly laid out, and the instruction book was well-written. Parts, both die-cut and machined, were accurate and, for the most part, fit well with little sanding. The parts and the balsa used were of a good quality, and I was pleasantly surprised to find a complete hardware package, a motor mount and all the required fasteners. The parts were grouped in a way that made finding the right one easy.

Construction went smoothly, and I almost completed the basic wing structure during the first evening. The project took one week of working evenings, plus Saturday and Sunday—less than 35 hours. Care must be taken to ensure that the wing comes off the building board straight, and that the fuselage sides are joined squarely and true, but this simple procedure can be completed with just a good square and patience. The lite-ply wingtip end plates are weak, and although my plane hasn't suffered anything more than a hard landing, both tips have already been damaged. These ply end plates should be replaced with ones of birch plywood, which would be more durable.

On the plans, the engine is shown mounted 90 degrees from vertical and, because the tank is quite high in the fuselage, this posed some fuel-draw problems with my K&B .40. With the engine mounted this way, the needle-valve's center line is lower than the tank's center line, and this causes the

engine to load up with fuel during vertical maneuvers at low throttle settings. I solved this problem by relocating the engine to 45 degrees from vertical, so raising the carburetor slightly above the tank's center line.

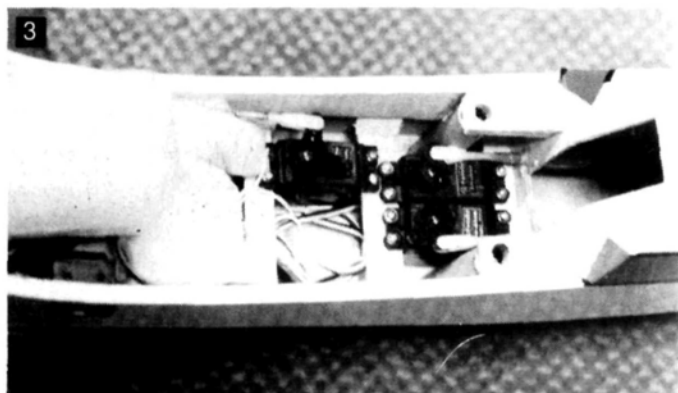
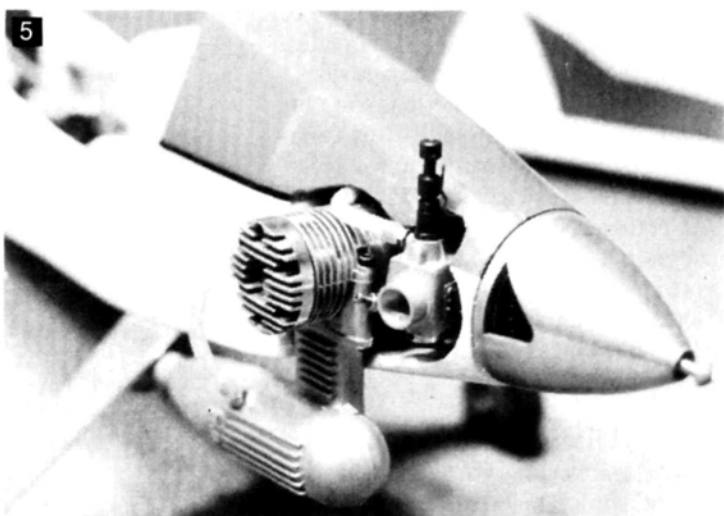
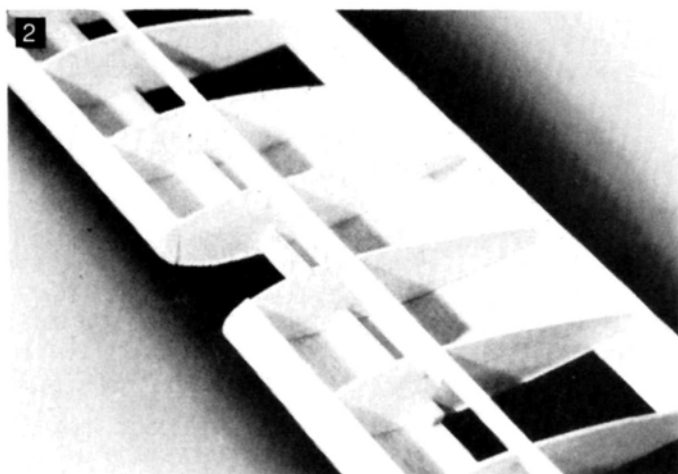
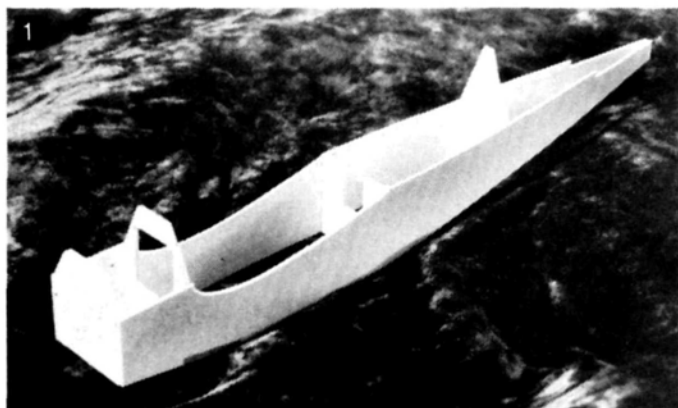
The kit's landing gear is strong and rigid. I attached mine with three 10-32 nylon bolts instead of the four $1/4$ -inch bolts suggested in the kit. I've yet to lose more than one bolt in a bad landing, and I think that with the $1/4$ -inch bolts, the gear wouldn't shear off as it's designed to do. The stiff gear also makes taxiing and landing on grass fields difficult, as the model bounces and jumps around. My model weighs less than 4 pounds, and the gear is too stiff, but it's not a major problem.

I treated the entire structure with Balsarite, and I covered it with MonoKote and Presto. Radio installation required care to ensure adequate clearance for the pushrods, but with a little planning, the radio went in easily.

With the center of gravity located as shown on the plans, the model flew well from the very first flight, with no trim adjustments. The Hots II will do any maneuver in the book! It flies as well inverted as it does upright; wing-overs are simple and smooth; rolls are straight and true; and knife-edge flight is good with a little rudder to hold the plane level.

With a good .40 for power, the Hots II will climb forever, and it's fast. The short tail moment takes a little getting used to, as the plane feels "choppy," but with a steady hand on the sticks, it's a smooth flier at any airspeed. The wingtip fences really do their job in slow flight, and on approaches, the plane can be slowed right down without fear of stalling.

The Hots II kit is easy to build, and the plane will provide experienced sport fliers with many hours of pleasure.



is novel: when the fuselage has been completed, the wing is fitted and the dowels tack-glued into place. Install the false ribs so that they surround the dowels and make them "bulletproof." (I must remember that method!)

Finish the wing by adding the rib capstrips and wingtip plates. Tip-plate installation was omitted from the instructions, but it isn't difficult to do: just cover them with iron-on film and glue them into place when the wing is completely covered

THE FUSELAGE

The fuselage is assembled almost as quickly as the wing! The sides and the doublers are of lite-ply, and there's nothing unusual about their assembly: the sides are joined to the F-1, F-2 and F-3

formers and squared up. Midwest includes a nylon motor mount and the hardware needed to attach it to the fire wall. In fact, the kit has a complete assortment of hardware, so you don't have to search the hobby shop for parts.

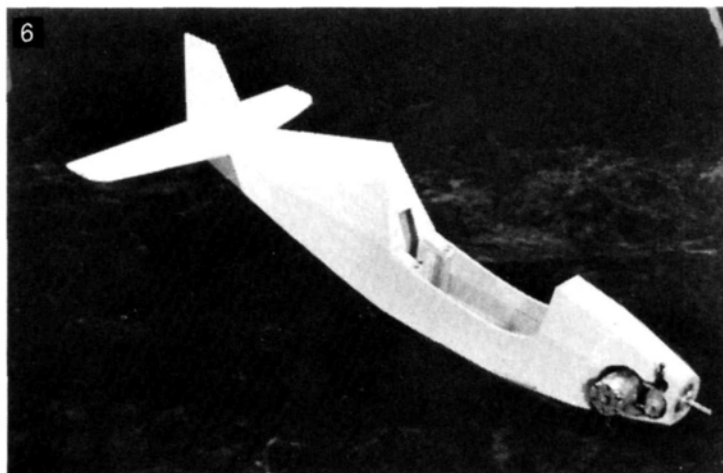
Bring the tail pieces together at the balsa tail post, and then install the landing-gear block. This is a large piece of hardwood that you must drill and tap before you can attach the Dural-type landing gear. The gear is attached with four 1/4-20 nylon bolts that will shear in the event of a crash and so minimize the risk of airframe damage. They're easy to re-install, too!

The sheeting of the fuse bottom begins with lite-ply, which extends from the nose to the bottom of the F-3 former. From

there, cross-grain balsa extends to the tail. The corners are reinforced internally with triangle stock.

Add the wing-saddle doublers and the wing hold-down blocks next. This brings you to another novel way to install the wing bolts: two paper guide tubes are provided to fit from the floor of the fuselage to the wing hold-down blocks. Holes are cut into the floor to allow access to the bolts with a screwdriver, so no ugly holes or bolts are visible from the top, and getting the bolts in from the bottom is easy.

As well as the previously mentioned omission of the wingtip-plate installation, there's another error that should be corrected. The wing bolts seem rather too short to fit into the wing from inside the



1. This is all that's required to produce a simple, but strong, fuse. It owes much of its strength to the pop-plywood used for its sides. 2. Close-up of the center section shows the doubled spruce spar over the center and main cutout for the fuel-tank clearance. Shear webs were added later, to increase strength. 3. With the radio installed, the fuel tank and radio fit inside the fuselage fairly easily. Full-size Futaba servos shown here. 4. So, how come we can't all have a paved flying site?—Team Kamikaze headquarters? Team President Lee is obviously pleased with the performance of Hots II. 5. Cowling around the engine can get cozy, if you like. I liked the tight look, and the ASP .46 looks as though it was made to fit here. 6. The fuselage has been completed and the engine installed. Newest Hots design looks clean and is functional. ASP .46 FSR ABC is mounted up front. 7. Broad, angular fuselage lines give the impression that the Hots II is close-coupled and "twitchy." Not true! Sport fliers will love it. 8. Nearly up close and personal, Mike's Hots II makes a flyby.

fuse. I felt that there weren't enough bolt threads engaged in the wing for safety, so I replaced the bolts provided with longer ones. (Ideally, at least three threads of the bolt should be visible through the tapped blocks.)

The pushrod installation is easy: nylon-rod tubes and 1/16-inch piano wire are supplied in the kit. Put the nylon tubes into place, and leave the upper fuselage open for final top fitting.

The tail feathers are made of pre-cut sheet balsa parts that align the wood grain in the best direction for strength and sanding. Pay particular attention to the way they're attached: make sure that the joints are solid, because there isn't much "meat" in the fuselage on which to attach the horizontal stab. (This has the vertical stab

mounted to it.)

After you've joined the tail feathers to the fuselage, you're ready to close up the top, which consists of lite-ply formers and balsa sheeting. A couple of angle braces are used to establish the correct slope for the formers. They aren't all assembled so that they stick straight up from the fuselage. This is a great help when building, and although the instructions tell you to remove them later, you really don't have to. The top portion extends right over the wing to form the canopy, so the wing must be bolted down snugly in its final position when this is done. The sheeting is easily accomplished and leaves plenty of room for serious final-sanding.

At last, you come to the cowling, for which two spinner rings are provided: one

SPECIFICATIONS

Type: High-performance, fun-fly sport model

Wing Area: 436 square inches

Weight: 4 pounds (dry)

Power Req'd: .40 to .45 2-stroke

Wing Loading: 20.6 ounces per square foot

No. of Channels Req'd: 4

Suggested Retail: \$95.95

Features: New, stronger, removable wing with new wing-tip design; more spacious fuselage; good hardware; excellent instructions and parts fit.

Comments: One of the best fun-fly planes has become even better! Fast assembly, good parts fit and great instructions make this kit a good choice for lazy builders. With a hot engine, flying characteristics are deadly for fun-flying and barnstorming, but the Hots isn't for a pilot with low flying hours.

is permanently glued to the cowl, and the other is used as a spinner spacer. For a custom-fit, the cowl is built around the engine, so the engine must obviously be in place for this operation. This is the only construction step that requires any real cutting and fitting. When you've completed this assembly, remove the engine and finish the sanding.

I used Satellite City* Hot Stuff and Super Hot Stuff throughout the assembly. To fuelproof the engine compartment, I gave the fire wall a coat of epoxy, and I covered the entire model with Ora-Cover—a new product from Hobby Lobby*. This iron-on, heat-shrink film requires a slightly different application technique than the one you're probably used to. As the instructions state, first stick

HOTS II

the film to the wood using medium heat. When the film is on, shrink it by using a slightly higher heat setting. Use this method over open areas (e.g., the rib bays) and solid wooden surfaces. Even when it has been completely stuck down, OraCover can be shrunk more! As a test, I applied it to a sheet-balsa part in such a way that it had wrinkles; then I ironed it down and heated it again to see if I could remove the wrinkles. Sure enough, they disappeared. Good stuff!

For power, I used the ASP 46 FSR ABC from World Engines*. This engine is manufactured in China, and its cousins have already gained a reputation for power and reliability. The engine features ABC technology in the combustion chamber, Schnuerle porting, a ball-bearing-supported shaft and a two-needle carb. The expansion-chamber-type muffler has a pressure tap already installed, and this compact engine weighs only 11.2 ounces.

I chose the Futaba* 7UAP PCM radio. This radio has more features than are needed to handle the Hots II (overkill?!), but its versatility is always a plus. The 7UAP has almost every option you could ever want, including dual rates, ATV, reversing, mixing, LCD display and push-button programming—and these are just a few of its goodies! You'll need four servos to guide the Hots II properly, and that just happens to be the number supplied with this radio.

It takes careful planning to fit everything into the Hots II. There isn't enough room for the large servo arms for the pushrods, so be happy with the smaller

arms and compensate for the reduced throws at the control horns. (You probably won't find it necessary!) I was able to fit all four standard-size servos, the re-

on the main spar, and when I checked the plane's balance for the first time, it was right on the money. I didn't even cheat—honest!

The specs call for a weight of between 3.75 and 4.25 pounds, and my Hots tipped the scales at exactly 4 pounds. Really! I used the kit-supplied decals, and they look perfect, too! The control throws were the only things that didn't manage to hit the specs perfectly, but that was because I knew I wanted *radical* control throws.

Since the construction had turned out so well, I was completely confident that this airplane would be great, so I packed my equipment and headed for the field.

PERFORMANCE

At the field, I fueled the Hots II with Powermaster's* 5-percent-nitro fuel. I installed a 10x6 prop from Master Airscrew*, primed the ASP 46, and the engine started on the first flip and idled right way. It was even more impressive when I opened it up. The tachometer showed the ASP was turning 13,600rpm—without break-in! Impressive?

When I lined up the Hots II with the runway, I "poured it on" and had it airborne in 15 feet! It lifted off nicely, without showing any tendency to ground-loop. The ASP quickly hauled the

Hots to altitude, and I trimmed the elevator and ailerons to neutral.

This plane is very solid and very quick; loops are tight at full-stick deflection, yet the Hots doesn't high-speed stall into a snap roll. Its roll rate is *really* rapid, so be ready for it! Although the rudder throw is

(Continued on page 83)

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ceiver and the 500mAh battery into place without them touching one another, and I also have foam wrap on the receiver. If you use miniservos, that's even better.

Either I lead a charmed life, or Midwest has everything planned just right! The instructions show the balance point right

SMALL STEPS

by RANDY RANDOLPH

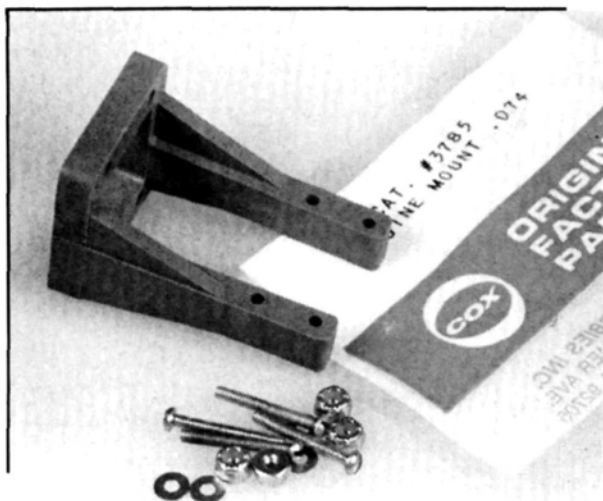
FOX* Manufacturing, one of the few high-volume producers of model engines left in this country, has developed a more efficient carburetor system for its popular Fox .15 engine. This new carb allows for a wide range of adjustments, which should result in better "gas mileage" for the engine. The instructions suggest that you prime the engine, rather than choke it, and I agree! It's easy to flood the engine by choking it, but one-flip starts are easy with a drop or two of fuel in the exhaust port. Some time ago, I mentioned that there was no engine mount for the new Cox* .074 Queen Bee. There is now! The mount is drilled especially for the .074, and the package includes the mounting bolts and the

locknuts. The carb, which extends behind the engine, has made it difficult to install in production-type mounts, so this new product is very welcome. You'll probably see it in the hobby shops before you see it here!

By the way, because Cox has made some changes to its Babe Bee to improve its fuel economy, it's now calling it the "Texaco." R/Cers will appreciate the changes as much as the free-flighters will. An engine



The Fox .15 has been improved. Can you spot the difference?



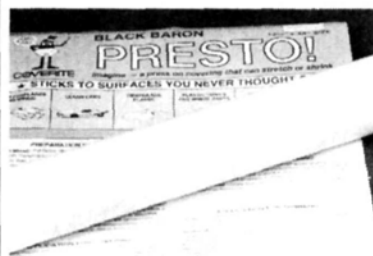
Better late than never: the Cox mount for the .074. Welcome!

that will run longer on a given amount of fuel is a blessing to any airplane. Besides, there are a lot of applications for small R/C engines that don't have a throttle; in fact, many sport models are just that way! Boy; a Texaco with an auxiliary tank should fly forever.

MORE NEW STUFF

Coverite* has a new film called Presto that's just the ticket for my kind of airplane—those with sheeted fuselage sides. Presto is coated on one side, and it will stick to almost anything. Putting film on a solid surface without creating air bubbles can be tricky, but Presto is applied like contact paper, and you rub out the

bubbles as you go along. Since it only has to be heated to seal the edges, air bubbles won't appear just when you think you've finished. (Looks like good stuff to use for add-on trim after the airplane has been covered—no bubbles between the layers of film!) Coverite still makes Micafilm—the lightest and toughest covering on the market. It's just right for airplanes that have weight problems (all of them!), and it's tough enough to take on the occasional tree that gets in the way of your plane. Here's a device that's easy to make and is useful when installing ribs. It's simply a 1/8-inch-thick plywood square with a 1/16x1 1/2-inch



Good sticky stuff from Black Baron. A real no-bubble covering for solid surfaces.



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notch cut in its bottom edge. To ensure that the notch is exactly perpendicular to the edge, check it with a square or a right triangle. Make the notch wider if you're using bigger ribs, but who wants bigger ribs!

The SMAL (Small Model Airplane League) rules committee is still undecided on one or two rules! They're happy with the first one: "There shall be no rules," but they can't decide on the second: "These rules can't be amended." Members in good standing will decide, so all in favor of both, raise both hands; those opposed, one hand!

If you're not a member, you may join at once by reciting the membership pledge: "I promise to enjoy and promote the building and flying of small model airplanes."

*Here are the addresses of the manufacturers mentioned in this article:
Fox Mfg. Co., 5305 Towson Ave., Ft. Smith, AR 72901.
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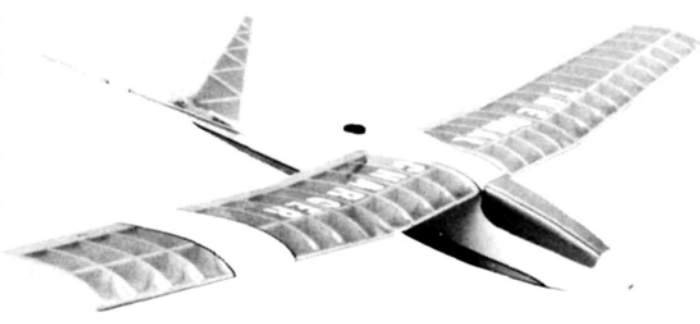
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AIR-CRAFT TEXAS OUTLAW 500

by RANDY RANDOLPH
with DREW JERINA

It may be an
"Outlaw," but it's
legal and fast!



"Call this the Red Airplane!" The bashful Drew Jerina tries to hide behind the wing as he identifies the Outlaw for flagmen at the no. 1 Pylon.

QUICKIE 500 RACING is an institution in Texas! There's a race somewhere in the state every weekend from early April to late November, and the Texas Outlaw has had more than its share of wins in these races—a lot more!

Most of the Quickie 500 fliers who race are much more interested in engines and racing than in building airplanes. Naturally, there are exceptions, but a successful Quickie kit must be quick to build as well as fast in the air, and Air-Craft's* Texas Outlaw is both!

THE KIT

This is an ARC (almost-ready-to-cover) plane, and it comes out of the box with a pre-sheathed-foam wing, a completely



Lucky shot caught the Outlaw still on the ground! Jon Smothers is the pitman.

SPECIFICATIONS

Type: ARC Quickie
500 Racer

Span: 50 inches

Weight: 3 pounds,
10 ounces

Area: 500 square
inches

Wing Loading:

16.7 ounces/
square foot

Power Req'd: .40

2-stroke (for rac-
ing)

No. of Channels

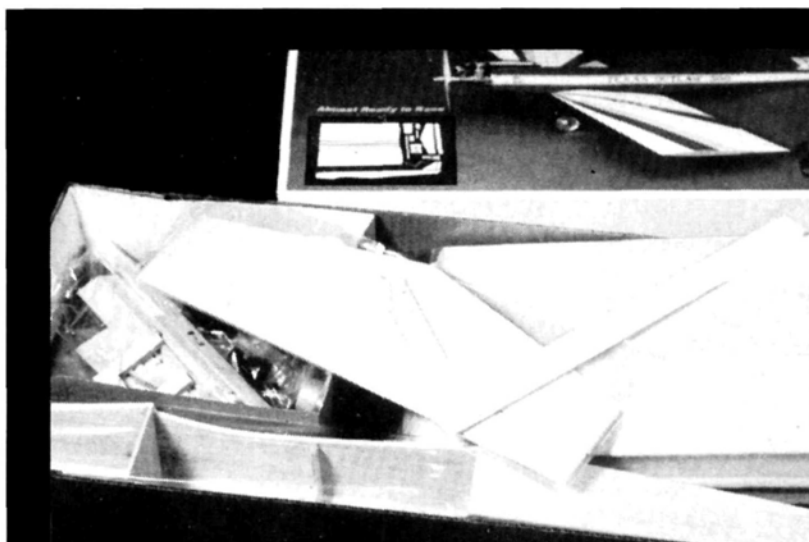
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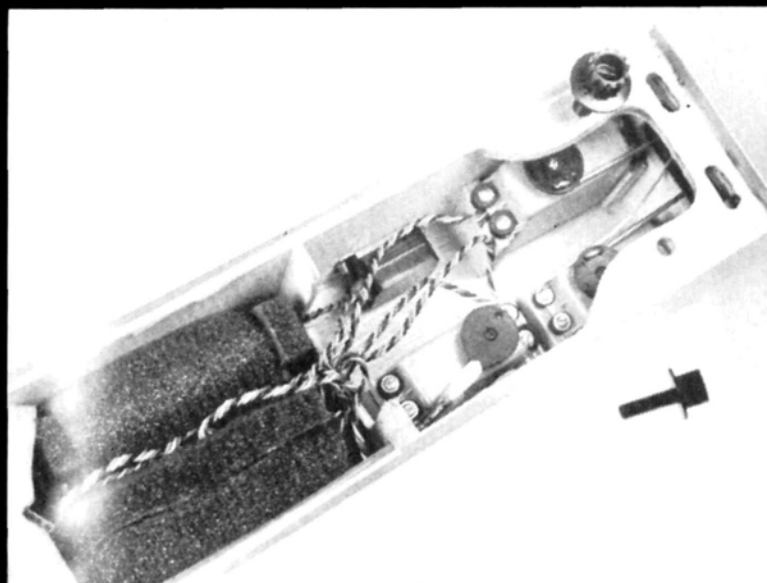
\$119.95

Features: High
level of prefabri-
cation; requires
only assembly and
covering.

Comments: Pre-
sheeted foam and
pre-built fuselage
will have you rac-
ing or sport flying
very quickly. High
quality through-
out; great kit.



When the lid comes off the box, this is what you see. The nearly finished fuselage, wings and tail are all individually wrapped and pretty!



Lots of room for the radio; nothing cramped here! The two oblong holes aft of the wing-mounting bolts allow access to the servo-mounting screws.

built fuselage, formed tail surfaces and ailerons and a complete hardware package. The wood on the fuselage and wings looked great because it had already been sanded to a silky, slick finish.

ASSEMBLY

The two wing panels are recessed to receive the hardwood spar that makes the wing a solid unit when the halves are joined. The spar comes already grooved for the landing gear, and it's machined to provide the proper dihedral. Once the trailing edges and ailerons

have been installed and the center section has been glass-reinforced, the wing is truly ready for covering. (The choice of covering is yours.)

After that, drill the wing's leading edge to receive the two hardwood locating dowels that, along with the nylon bolts, hold the wing to the fuselage. The holes for the dowel anchors have been pre-drilled in the front wing-saddle bulkhead, so it's easy to hold the wing in the saddle and drill through these holes into the wing. In this way, the front former acts as a drilling jig.

There's a choice of ways to anchor the wing bolts in the fuselage. The kit provides two threaded plastic anchors that can be attached to the fuselage sides, or you can use a U-shaped piece of 1/4-inch plywood that can be drilled and tapped to provide an anchor. The latter method is by far the easier, because by drilling the wing and the ply mount at the same time, you're sure to keep the parts aligned.

With the wing mount in place and the fuel tank installed, the elevator and rudder can be hinged and mounted, and the completed

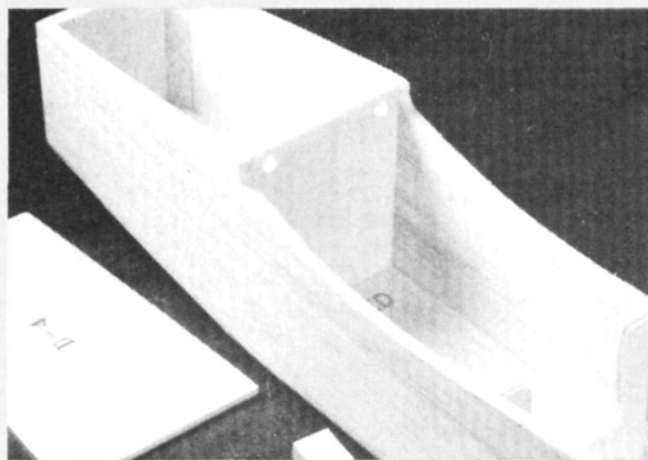
fuselage can be given a final sanding before you cover it.

Since I hadn't raced since the early '70s, it seemed a good idea to ask for help from someone with more experience, so I turned the project over to Drew Jerina, who completed it for me. Drew has built more Quickie racers than almost anyone, and it's safe to say that you'll find at least one or more of his airplanes in most of the races in Texas!

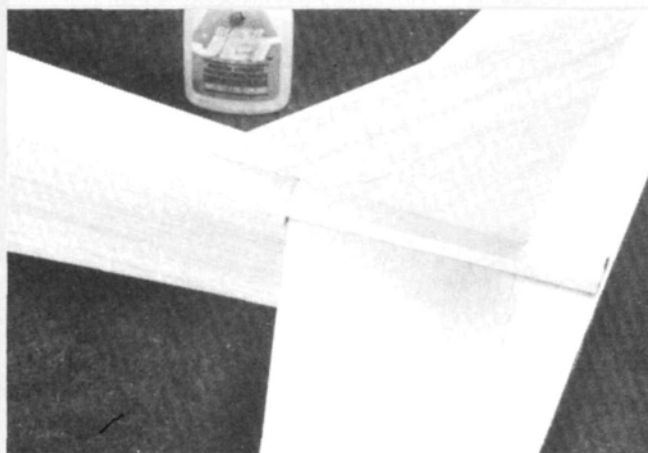
This is what the old master had to say about the Texas Outlaw:

"The few parts that required assembling fit very

TEXAS OUTLAW 500



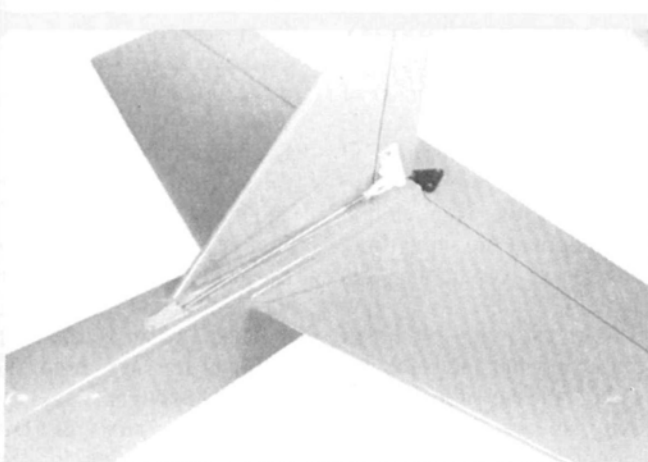
When the fin and stab are in place, only hinging the elevator and rudder and a little sanding are necessary before covering.



The wing halves have been joined and the hardwood spar-gear mount is in place. The joint hadn't been sanded; that's a good fit!



Out of the box, the fuselage is finished, except for mounting the tank. The glued joints were solid and very well-fitted.



The finished tail group. The elevator pushrod and the antenna exit the rear of the fuselage.

well, with one exception: the plywood wing mount is just a little too narrow to fit between the fuselage sides, so it required shims and clamping to secure a good fuselage-to-mount joint. Since this was to be threaded for the wing bolts, a good mount-fuselage joint was essential. If the threaded hardware provided was to be glued to the fuselage sides, naturally, there wouldn't have been a problem.

"To finish the wing mounting and to be on the safe side, cut a $\frac{1}{8}$ -inch slit about $1\frac{1}{2}$ inches aft of the leading edge, at the wing center section; embed and glue a $\frac{1}{2} \times 3$ -inch piece of $\frac{1}{8}$ -inch plywood perpendicular to the plane of the wing. Drill this plywood up through the leading-edge dowel holes, then install the leading-edge anchoring dowels."

Drew finished the Outlaw with MonoKote* and mounted a Rossi* .40 up front. A cabin profile was added for that personal touch, and the final weight (including a 4-ounce tank) was a little more than 1 ounce on the safe side of the required minimum!

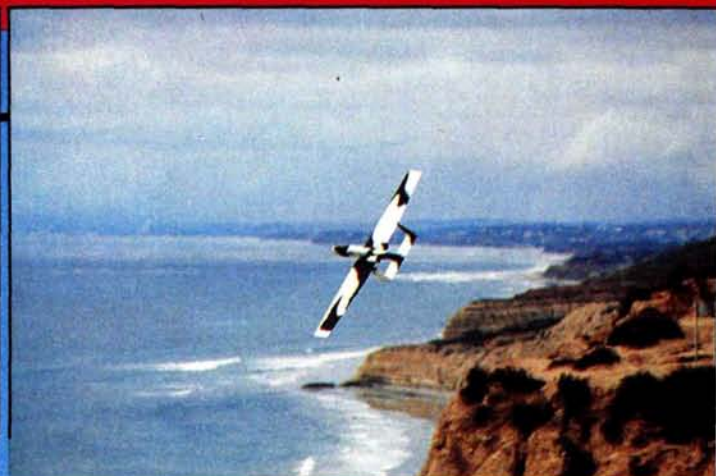
FOR SMALL-STEPPING SPORT FLIERS

The Texas Outlaw is a racer; that's what it was designed for, and that's what it does! It's fast and smooth; it holds well into and out of turns; and it's solid at all speeds from flat-out to just before touchdown. It isn't a beginner's airplane, but anyone who's comfortable with a clean, .40-powered sport plane will have no trouble with the Outlaw.

Since the Outlaw is such a reasonably priced, highly prefabricated kit, it would make a dandy sport plane with a .20 up front. Let's see...the fin-rudder and stab-elevator could each be enlarged about 50 percent to give more control and make snaps and spins easy...and if the wheels were bigger and softer so grass would be more friendly....

*Here are the addresses of the companies mentioned in this article:

Air-Craft, 4104 Lark Lane, Houston, TX 77025.
MonoKote; distributed by Top Flite Models, 2635 S. Wabash Ave., Chicago, IL 60616.
Rossi USA, 2178 Forest Ave., Staten Island, NY 10303.



by JOHN LUPPERGER

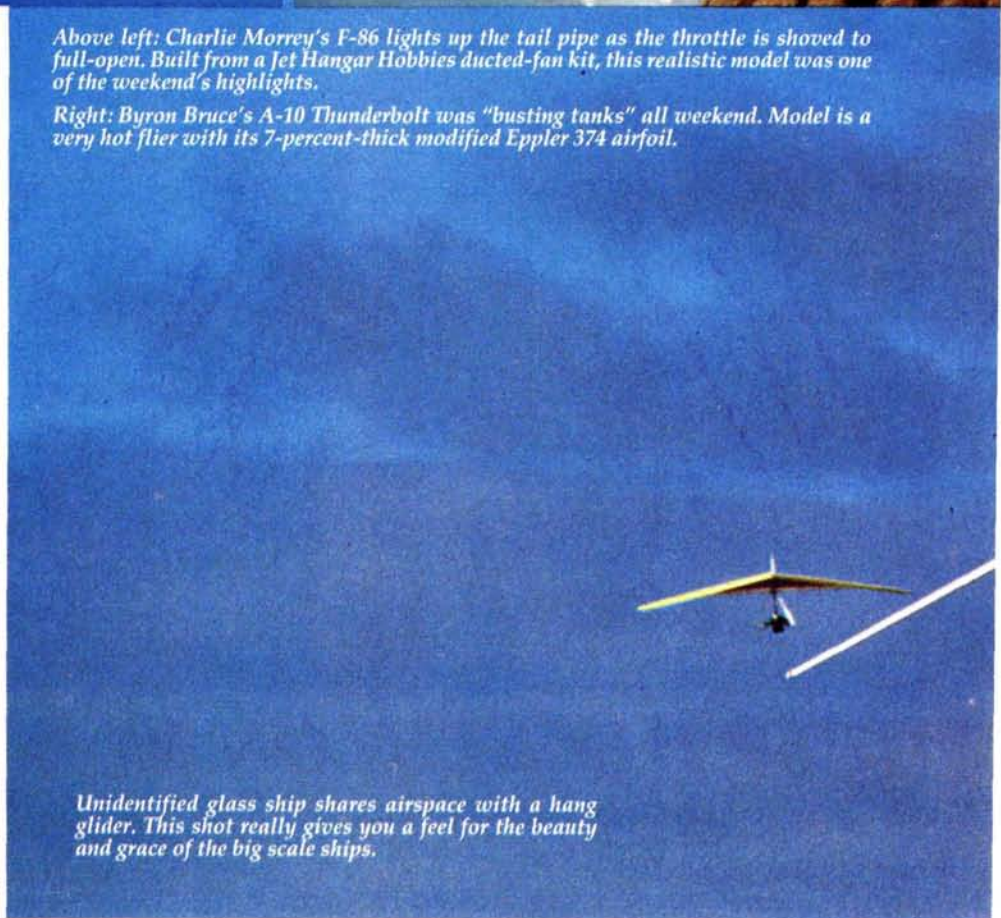
HAVE YOU EVER heard the phrase "spreading like wild-fire"? When the Torrey Pines Gulls decided to hold their own fun fly in California late in the year, every effort was made to spread the word to as many people as possible, and Thanksgiving Weekend, 1989, marked their First Annual Scale Fun Fly for sailplanes and power scale slopers.

The format the used was started two years ago by the Tri-Cities Soarers in Washington, and was originally the idea of Bill Liscomb of Los Angeles, CA. Word got around quickly when Torrey Pines announced their plans, and many new scale projects were started!

I attended the fun fly only on Saturday, but I've heard that day's wind and attendance were better than those on Sunday. During the three-day event, more than 60 pilots showed up with at least 210 aircraft!

Above left: Charlie Morrey's F-86 lights up the tail pipe as the throttle is shoved to full-open. Built from a Jet Hangar Hobbies ducted-fan kit, this realistic model was one of the weekend's highlights.

Right: Byron Bruce's A-10 Thunderbolt was "busting tanks" all weekend. Model is a very hot flier with its 7-percent-thick modified Eppler 374 airfoil.



Unidentified glass ship shares airspace with a hang glider. This shot really gives you a feel for the beauty and grace of the big scale ships.

FUN-FLY FORMAT

The format was set up with fun in mind. Pilots were supposed to bring their scale sailplanes or power scale slopers, fly, shoot the breeze, brag and show off! As you might expect, this format proved to be a huge success.

No matter which type of scale soaring model you like, there was something for everyone: vintage and classic sailplanes, glass superships, WW II power scale slopers, early jets, modern jets and even a scaled-up, 25-cent hand-launcher. That's right: Ray Smith blew up a Jim Walker 74 Fighter into a 72-inch span! The original (wingspan 12 inches) was designed

by Jim Walker in 1948, and it was available until 1963. Ray's 74 Fighter wasn't a true scale model, but I think it elicited more excitement and conversation than any model at the fun fly. It was exact in every detail, from its fully sheeted surfaces to its absolutely authentic red-and-blue finish, which was applied directly to the balsa. The model has a symmetrical airfoil, a flying weight of 4 pounds and a wing loading of 10 ounces to the square foot. Control was by means of rudder, elevator, ailerons and flaps. When Ray flew, almost everyone watching felt nostalgic. More on this bird in the future.

TORREY PINES GULLS

1ST ANNUAL FUN FLY

210 SLOPERS HEAD OFF THE CLIFF—AND ON SHORT NOTICE!

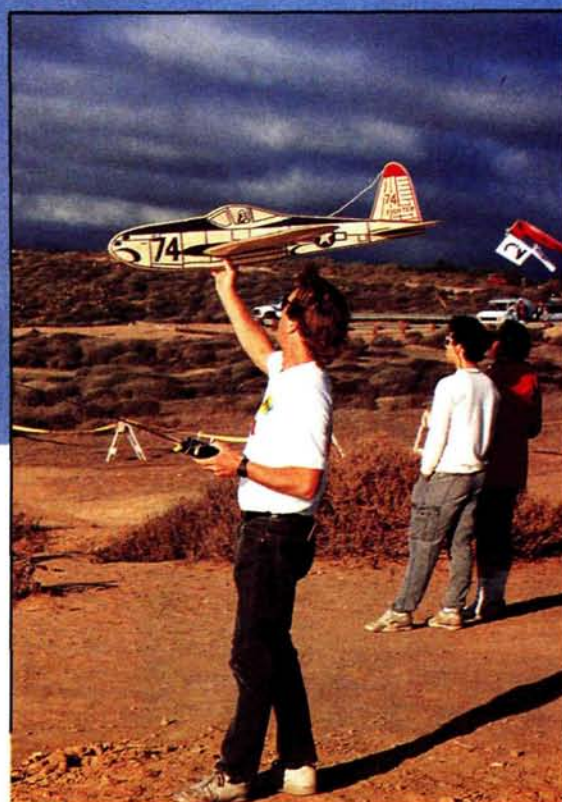


AMAZIN' ALBATROSS

There were so many great models at the event that it's difficult to single out particular ones, but a few were outstanding, e.g., the Albatross by Wayne Spani, who had building and design assistance from Keith Hollenbeck. Although this model didn't fly, it demanded attention because of its overwhelming size—all 21 feet, 3 inches of it!

The Albatross is a proof-of-concept model for a full-

(Continued on page 77)



Ray Smith looks slightly out of scale holding his 74 Fighter as he gets ready to "hand-launch" it out over the Pacific. This model created more excitement than any other.

PHOTOS BY JOHN LUPPENCER

TORREY PINES

(Continued from page 75)

scale sailplane. The model started as an ASW 20, which is available from American Sailplane Designs*. New wings cores were cut using the FX-60 126 airfoil; larger tail surfaces were made; all surfaces were glassed; and the fuselage was stretched several inches. It will be controlled by rudder, elevator, ailerons (two for each wing), spoilers, flaps, aero tow and retract. Its projected flying weight is 18 pounds, and its wing area will be 2,045 square inches for a wing loading of 20.2 ounces to the square foot. To finance his full-scale ship, Wayne plans to offer kits. I've been promised an invitation to the test flights, and I'll be sure to take some shots that I'll share with you.

SUPER SABRE

Another exceptional model was an F-86 Sabre built by Harry Finch. It was finished and flown by Charlie Morrey, editor of *Slope Soaring News*. Harry built the model from a Jet Hangar Hobbies* ducted-fan kit. He had test-flown the unfinished model, but he wasn't impressed with its performance. Charlie had been admiring the model hanging in Harry's shop and finally convinced Harry to sell it to him. Charlie made several modifications (including closing off the fan duct, front and back) that he felt would produce a better performance. After a few test glides to

verify its "flyability," Charlie painted the model and produced one of the nicest-looking power scale slopers you're ever likely to see!

It took some heavy-handed ribbing to persuade Charlie to throw that beautiful model over the 400-foot cliff at Torrey. I

don't recall ever seeing a pilot quite as nervous, but the F-86 flew well right from the start! If any Korean War vets were at the fun fly, the flight of the F-86 must have brought back many memories! If it weren't for the eerie silence, at a distance, it would have been very difficult to distinguish

it from the full-size one. At five pounds, the model is actually slightly light. After that very successful first flight, I heard Charlie say that he could hardly wait for some strong wind so that he could ballast up the F-86 and see what it was really



Activity on the hill was constant; to show off their creations and flying skills, all the pilots wanted as much air time as possible. A crowd of spectators was there to encourage them.



The replica "74 Fighter" by Ray Smith, albeit in a much larger size, sure brought back some fond memories to some of the "30 Something" modelers.



Wayne Spani's Albatross model looks almost big enough to sit in! If all goes well, this beautiful plane will be built in full scale.



What appears to be a landing gear on Charlie Morrey's F-86 is actually a display dolly. Clever idea, keeps it off the ground when static.

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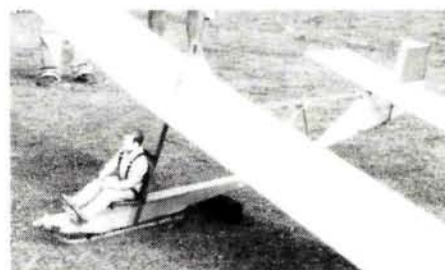
TORREY PINES



The pit area was filled with every type of model imaginable. Unusual power scale slopers can be seen in the foreground—an A-4 Skyray, and an Me 163 rocket plane. These are just a few examples of the creativity of slope fliers.



Lined up in the pits, glass slippers show the beauty of modern sailplane design and technology. Even though most of these models sport a fairly high wing loading, they were able to fly and gain altitude in moderate wind.



Angelo Orona's SG-38 was a real work of art. Pilot had on a full harness with working buckles! Craftsmanship on Angelo's model was as good as it gets, and he still had the guts to throw it over the side of the cliff!

capable of. I hope I get to see that!

Next year's event is in the early planning stages, and the date hasn't yet been set; as soon as it is, you'll read about it in *MAN*. To the Torrey Pine Gulls, CD Martin McBride and everyone else who helped put the Fun Fly together: congratulations on a job well done!

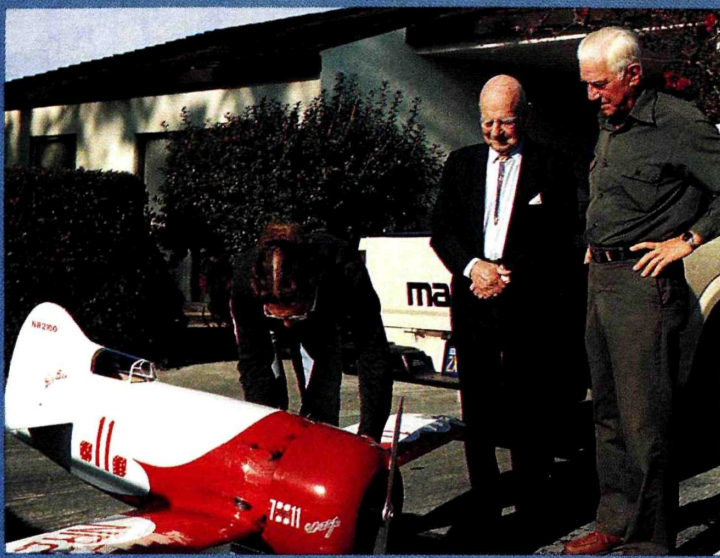
I hope the pictures excite you so much that you'll plan to attend next year's event, either as a participant or as a spectator. See you there!

*Here are the addresses of the companies mentioned in this article:

American Sailplane Designs, 2626 Coronado Ave., #89, San Diego, CA 92154.

Jet Hangar Hobbies, 12130 G. Carson St., Hawaiian Gardens, CA 90716.

Mike Johnson assembles the 1/4-scale Gee Bee R1 while Jimmy Doolittle and his son, John, look on.



by JOHN SULLIVAN

Oh, sweet mysteries of flight

THIS IS REALLY two stories in one. On one hand, it's a tribute to Jimmy Doolittle, a pilot whose name became synonymous with propeller-driven aircraft, and a legend who outlived an era when men were made of steel and their ships were made of wood, tubes and fabric. It's also a tale of amazing coincidences, a story of how history is made, and how each of us, for reasons not entirely understood, become keepers of history.

WE PICK UP the story on August 23, 1932, in the skies over Wichita, KS.

GEE BEE

R 1 R A C E R



Mike Johnson's beautiful Gee Bee R1 rests on the placid waters of Lake Wallis in northern California.

PHOTOS BY JOHN SULLIVAN

Jimmy Doolittle was test-flying his own Thompson Trophy entry, a highly modified Laird Super Solution biplane, when he discovered that the retractable gear wouldn't extend completely. Jimmy wrote, "Something's wrong with landing gear. If any suggestions, write on side of plane and come up," and dropped the note to the ground crew. Within minutes, another plane joined him in the air, with the message written on the side of the aircraft: "Zoom right, zoom left, power dive." Ten minutes of zooming and diving produced no change, so Jimmy decided to burn off his fuel and then landed with the gear in that position. Although the damage was minor, it wouldn't be ready for the nationals, which were the following week. Jimmy was left without a "ride" for the Cleveland Air Races.

He was already something of a legend. The first person to graduate with a Doctorate of Aeronautical Engineering from MIT, he'd won the 1925 Schneider Race in a Curtiss R3C-2 and, in 1929, executed the world's first instrument landing.

Zantford Granville heard of Jimmy's misfortune with the Laird. Zantford needed a pilot for the Granville Brothers' new R1, and he called to see if Jimmy was interested in flying the Gee Bee in the Thompson Trophy Race. Jimmy said yes, and the following day, he flew to Springfield, MA, (home of the Gee Bee factory) in a Shell Lockheed Vega.

JIMMY MEETS THE GEE BEE

The Gee Bee R1 was once described as a plane that "had no center of gravity." Jimmy walked around the plane, which was parked in the grass at Bowles Agawam Airport, and fired a barrage of questions at the Granville crew. When he was satisfied, the Gee Bee was pushed into takeoff position. Jimmy was strapped in, and the huge, 1334-cubic-inch, 9-cylinder Pratt & Whitney Wasp roared to life.

In the air, he immediately determined that flying the Gee Bee was "like balancing a pencil on the tip of your finger." Jimmy never even circled the field. He nudged the big nose in the direction of Cleveland, OH, and disappeared over the horizon! Two hours later, Granville received a telegram: "Landed OK Cleveland."

In the week before the Thompson Race, Jimmy took the R1 up again for a little practice. He remembered the plane's extreme sensitivity on the flight from Springfield to Cleveland, so he took the Gee Bee up to 5,000 feet and put it over the triangular pylon course, which had three 10-mile legs. With the 800hp Wasp screaming, he came over the first pylon and threw the Gee Bee into a tight, knife-edge turn. To his horror, the plane snap-rolled twice before he could regain control! His caution had paid off: had he attempted that knife-edge at a normal race altitude of 50 to 100 feet, both plane and pilot would have entered the history books long before they actually did!

QUALIFYING & POLE POSITION

To fly in the Thompson Race, entrants were first required to qualify in the Shell Speed Dashes. On his first attempt, Jimmy blazed through the traps at more than 293mph. This

would have been a new record; unfortunately, someone had forgotten to fit an barograph in the Gee Bee to record altitude. Two days later, on September 3, Jimmy again blasted through the traps for the required four runs, and he posted speeds of 293, 287, 309 and 281mph! Jimmy and the Gee Bee first broke the existing record, then he bettered his own record! This put him in the pole position for the Thompson Trophy Dash on September 7.

The lineup for the 1932 race was perhaps the most illustrious in aviation history. Just sitting on the runway, the planes were stunning, resplendent in their stark color

The Gee Bee R1 was once described as a plane that "had no center of gravity."

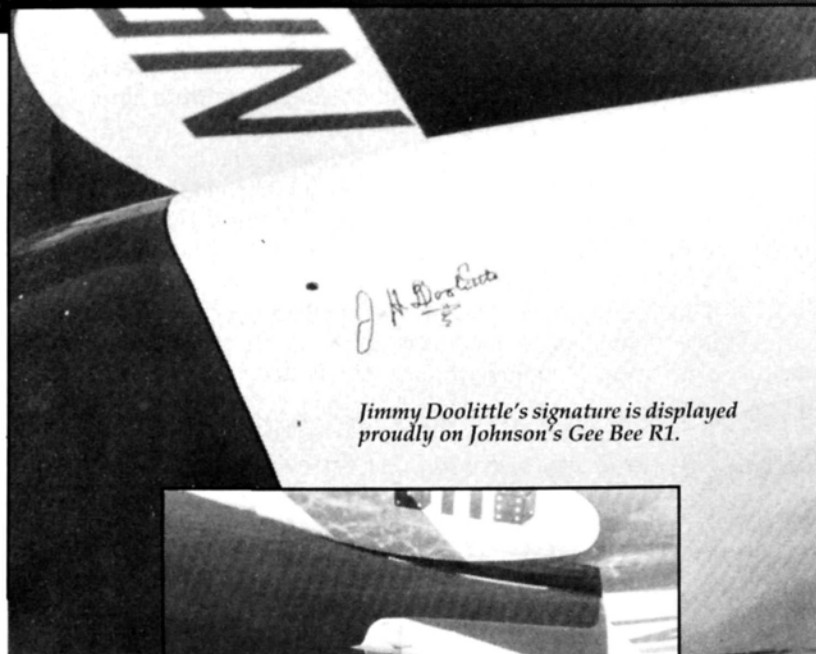
schemes. The pilots' names—Doolittle, Hall, Wedell, Turner, Ong, Moore, Haizlip, Gehlbach and Bowman—read like a "Who's Who" of cutting-edge pilots. It's hard to imagine what the excitement must have been like: 60,000 spectators watched for the drop of the flag, while nine 260 to 800hp Mennasco and Pratt & Whitney unmuffled radials roared, strained against the chocks and blew grass and gravel 100 yards behind them.

At the drop of the flag, Doolittle and Gehlbach's Gee Bees and Bob Hall's Bulldog shot ahead; their variable pitch props gave them a better bite. The rest followed, but Lee Bowman's Israel Redhead was left on the ground with engine problems. In the air, as he began to build speed, Jimmy passed Hall's Bulldog in the first lap and screamed past the stands in the lead. By the end of the second circuit, Jimmy had lapped Bill Ong's Howard Ike while Moore's Keith Rider and Wedell's No. 44 were gaining on Hall, who still held second position. Jimmy was taking the turns wide, flat and running rich. By the end of the seventh lap, he had passed Gehlbach's R2 and Roscoe Turner's Wedell-Williams. During the tenth lap, he passed Jimmy Haizlip's Wedell-Williams and streaked across the finish line. In 10 laps of 10 miles, he had passed five out of six competitors and left Jimmy Wedell's No. 44 almost a lap behind. His 252.7mph speed for the 100-miler established a closed-course speed record that wasn't broken until 1936 (four years later), by the French Caudron.

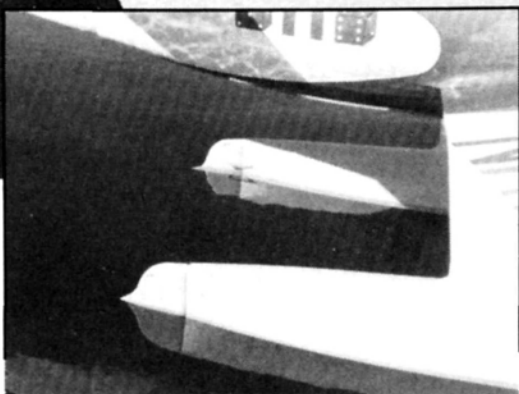
As Jimmy taxied up to the winner's circle and got out of the Gee Bee, he noticed something was amiss. There were very few photographers around. He discovered later that the press, who thought he would crash, had followed his wife and children around, expecting to record the horrified looks on their faces. That was enough for Jimmy. The next day he flew the Gee Bee to Springfield, and in his words, "Landed it, taxied up to the line, and gratefully got out." The relationship between one of history's greatest pilots and the most famous race plane of all time had ended.

TODAY

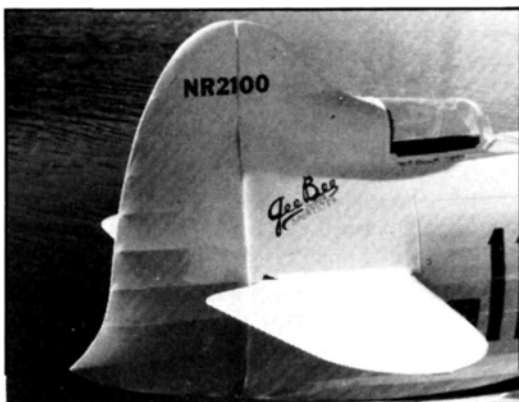
From the first moment that Mike Johnson laid eyes on a



Jimmy Doolittle's signature is displayed proudly on Johnson's Gee Bee R1.



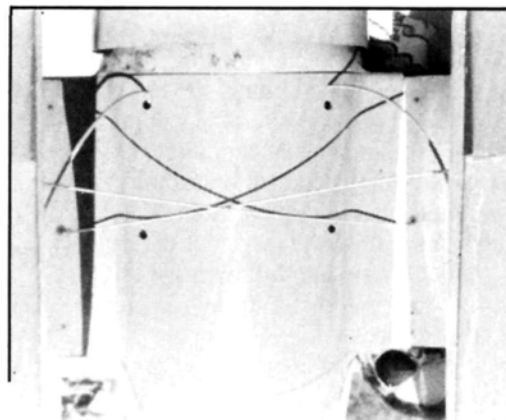
Float rudders repeat the air-rudder profile. Note control cables exiting from inside the stern wall.



Rudder on the full-scale Gee Bee was 1 foot thick at the stab line. The 1/4-scale model mimics the original, right down to the internal hinging. Hatch under No. 11 allows entry and is then screwed shut. Breakaway feature allows egress.



Aileron servo is buried in wing. Servo arm (barely visible in aileron root) plugs directly and serves as a hinge point.



Water-rudder cables enter molded belly pan to reach servo mounts on top of pan.

picture of the Gee Bee, he knew that, someday, he would build one. At the time, he had no modeling skills or experience, but Mike just knew that this plane was fast, ornery and awesome. The Gee Bee gives that impression. Even as a 1/4-scale model, the Gee Bee looks as if it would take serious exception to any unflattering comment directed toward it.

Mike's Gee Bee was built from Haffke Plans with a few important changes. To construct the fuselage, the plans called for a central core, an intermediate core and an outer stringered shell. This seemed like a circuitous route, so Mike eliminated the intermediate core by fabricating formers that mounted directly on the central core. The other changes were made to accommodate the increased frontal area and weight (he projected 5 pounds) of the floats. In an attempt to reduce the wing loading, Mike stretched the span by 20 percent, and to help control yaw, he enlarged the fin and rudder area, also by 20 percent. As you can see from the pictures, the outline and planform deviations are barely noticeable.

The Gee Bee was outfitted with a Zenoah G62 powerplant swinging a 24x10 wooden prop and a standard radio for its first flights. Ready to fill up and fly, it weighed in at 25 pounds even, for a whopping 52-ounce-per-square-foot wing loading.

Mike was understandably worried, but during construction, we had heard that Jimmy Doolittle might be attending the Schneider event, which was barely three weeks away. Suddenly, it was very important to finish this bird and test-fly it. We felt there was nothing better we could do than to bring the Gee Bee to Havasu and fly it for Jimmy.

We used the float formula that was published in the September '87 issue of *MAN*, with a 3-degree V added to the rocker and cutaway surfaces. During taxi trials,

(Continued on page 98)

NEW ENGLAND FAN FLY

(Continued from page 59)

Miller kit. Its most interesting feature was a fully detailed cockpit with servo-operated, pop-up canopies. It looked great in the air—canopies closed, of course!

In spite of the heat, most of the equipment seemed reliable, and the attrition rate was low. There were a few minor prangs, and a couple of bad ones, too. To prevent embarrassment, all those pilots shall remain nameless!

Thanks to all the workers and Dwight Aube, and congratulations to the Mohawk Valley Modelers club for a great first annual New England Ducted-Fan Fly! ■

MIDWEST HOTS II

(Continued from page 64)

negligible, the rudder is very effective. The Hots can perform a climbing knife-edge, and it's the first airplane I've flown that can do this without modifications to the kit or its design.

Slow-speed handling is quite good, but the ailerons fade quite a lot. There aren't any nasty slow snaps on landing, but if you don't want the landing gear to hop you around, you have to be good at greasing it in.

During the next few flights, I really put the Hots II through its paces. Snap rolls are outrageous, and stall turning is positive. There's some roll coupling when the rudder is deflected hard; this is evident when performing point rolls and knife-edge flight.

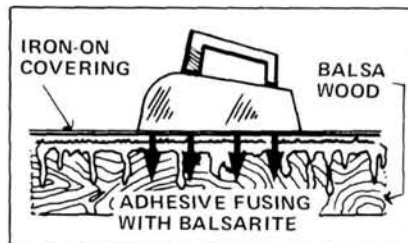
When I was asked to fly the Hots as an all-out fun-fly bird, I found I could coax it into a touch-and-go every 12 seconds when flying a circular pattern. Spot touch-and-go landings are a breeze—it hit a 10-foot spot nine times out of 10 every 15 seconds! With its ability to take off and land quickly, the Hots II is one deadly fun-fly plane.

As I said at the beginning, every once in a while, an outstanding design shows up. The original Hots was superb, and the Hots II is even better. An average builder will have this model airborne in less than three weeks, and it can be put together for less than \$200 (including engine and building materials). Powered by the ASP .46 FSR ABC, the Hots II is limited only by your flying abilities, so if you like fast planes with top performance, step up to the Hots II. It's hot!

(Continued on page 98)

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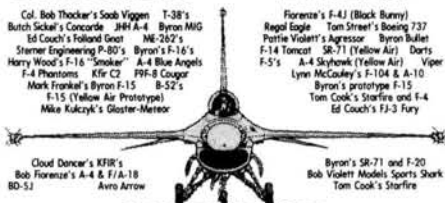


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SERVO-TRAY INSTALLATION

The stuff that stops the leaks also dampens the vibrations!

by MIKE LEE

I'VE DISCUSSED SERVO installation in fiberglass fuselages by using plywood trays and silicone adhesive. (Silicone adheres aggressively to fiberglass and provides excellent vibration-dampening for the radio gear. It also makes it very easy to remove the tray.) Now I'll tell you how to install a tray in a wooden fuselage using the same materials.

Wooden fuselages have several advantages over fiberglass ones: they dampen vibration well, they absorb sound much better, and they're stiffer. On the other hand, they take longer to build, they must be carefully aligned for true flight, and they may weigh more than a fiberglass fuselage, depending on how well it has been assembled and sanded. Even though (in pattern, at least) fiberglass models are a little more common, there are many wooden ones out there, and in the sport category, wood is dominant.

Mounting a servo tray in a wooden fuselage takes only slightly longer than mounting one in a fiberglass fuselage. Start by fitting the tray into the fuselage. Make sure that there's a gap of approximately $\frac{1}{16}$ inch between the sides of the tray and the fuselage, and mark the tray's position on the fuselage sides with a pencil. Attach two lengths of $\frac{3}{8}$ -inch triangle-stock balsa to the sides of the fuselage with CA, so that they lie just below the tray's final position.

When they're securely in place, run a generous amount of silicone adhesive over the top of the tri-stock balsa. Put the tray immediately into position, and press it down firmly, seating it into the silicone. *Don't* let it touch the tri-stock. When the tray is in position, run another bead of silicone adhesive along the line where the tray meets the fuselage sides, and allow the adhesive to cure overnight. You now have a vibration-dampening tray that won't come out unless you want it to. (To remove the tray, simply

GYROSCOPIC EFFECT AND SHUCKED BLADES...

Many pilots use the new, soft motor mounts to minimize vibration and noise. They work well for this, but there's at least one problem with them, and it concerns the prop.

Mac Patterson of Mac's Models in San Jose, CA, has noticed something about the gyroscopic effect of the prop on a soft engine mount and the flexing that occurs. Several APC props have lost a blade in flight for some unknown reason, but their aircraft had one thing in common—a beam-style soft mount (manufacturer unknown)—and their pilots all reported that blade separation occurred when the aircraft were accelerating and pitching hard through a maneuver. (This action is common in FAI flight; most of us fly at half-throttle during level flight, yet throttle-up when pitching up to vertical.)

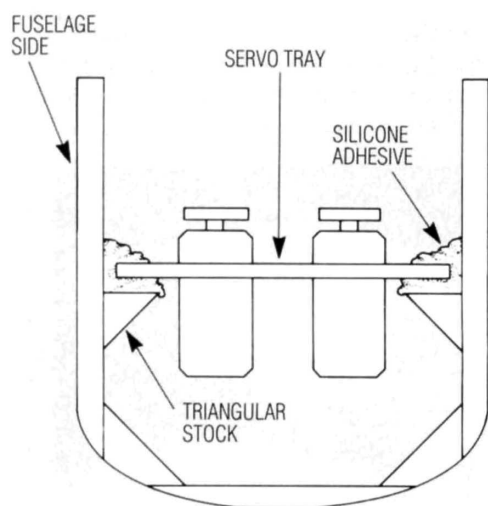
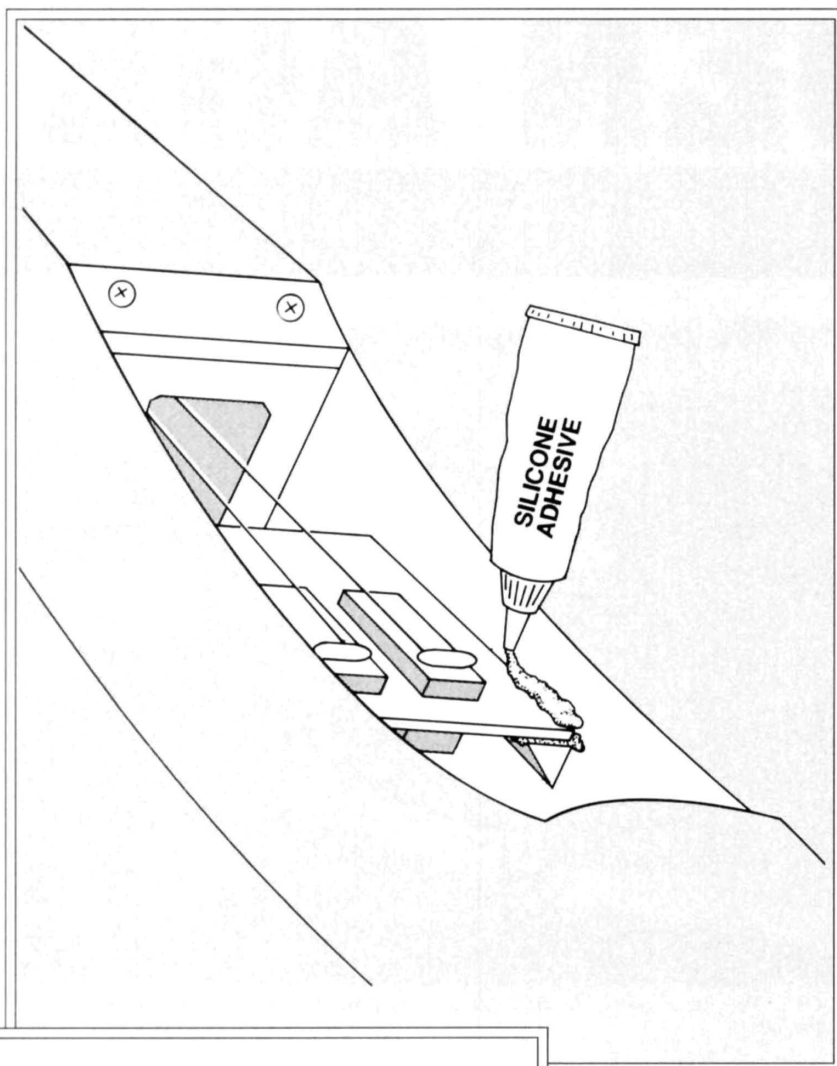
You can reproduce this effect by spinning a gyro or a vertical bicycle wheel. Hold the spinning wheel like a propeller in straight and level flight. Now, attempt to tilt it sideways; it will resist. This is a gyroscopic effect. The prop on your engine behaves

similarly; it will resist the movement when the plane pitches its nose upward or downward.

I saw a prime example of this at the 1982 Lincoln Nationals when Dean Copeland flew his CAP 21 from the runway during a scale flight. His takeoff maneuver included a snap roll, and when he did it, his Quadra engine's crankshaft snapped. The cause was determined to be the gyroscopic effect of the engine's flywheel resisting the changes in angle at which the plane was flying.

That's interesting, but our engines don't have anywhere near the mass of a Quadra flywheel. Nevertheless, the APC prop is heavier than any other pattern prop on the market. The gyroscopic effect of any spinning object is a function of its mass and, to some degree, its rate of rotation. With the APC prop, a certain mount allows the engine to flex in a plane of movement that's highly resistant to the gyroscopic effect created by the prop. This happens when the aircraft is made to pitch upward, and the resistance is amplified under acceleration. The result is catastrophic prop failure.

Wow! You'd better accelerate first and then pitch up. It works for me; I haven't popped one yet!



CROSS SECTION OF SERVO TRAY INSTALLATION
(NOTE TRAY IS SUSPENDED IN SILICONE AND DOESN'T CONTACT FUSELAGE STRUCTURE)

Diagram showing radio-tray installation in a wooden fuselage.

slit the silicone along the corner joint with a sharp razor blade and pull it up.)

The best thing about this type of installation is that you can put all the servos into the tray, position it fore and aft until they're exactly where you want them, then let the silicone set. If you're worried about whether this installation is rigid enough for the servos, don't worry. The force applied to the servos as they control the flying surfaces is resisted by the tray, which is securely attached to the fuselage. The fuselage will crumble like an accordion before the tray breaks loose! ■

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NEWS FROM READERS

I ALWAYS ENJOY your letters, and Bill Mitch of Hebron, IN, checked in with some pertinent information. He wrote about Tony Grish, whose name is synonymous with the Tornado props for which his company is responsible.

Bill tells us that, with the perfect flights of his Live Wire Trainer, Tony coaxed him to move on from C/L to R/C. You'd expect a great performance from Tony, because he was dedicated to his work with model planes and completely dominated C/L Class B speed records for several years; no one could come even *close* to his times. When asked why he didn't compete in other classes, Tony said he would

when he knew he could duplicate his Class B achievements—only perfection was good enough! He started flying R/C because he wanted to evaluate the performance of his Tornado props in the—then new—phase of modeling.

He obviously wanted the supremacy of his Tornados to continue!

Tony's son Tom now operates Grish Bros., and he recently started to fly R/C airplanes for the same reason—to evaluate new R/C prop designs. I've heard that there will soon be some new Tornado props, especially for R/C.

Inspired by Tony to

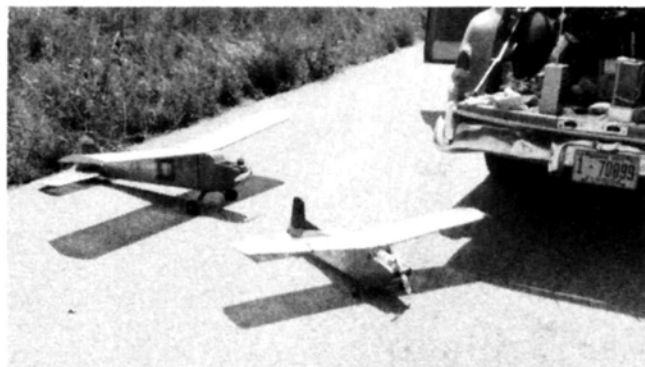
move to R/C, Bill Mitch followed his example in using a Live Wire Trainer;



OT'er Pete Hendricks with his Andrews Sport Master and Live Wire Cobra from the '60s.

his was powered by an OK Cub .09, and he used a Mac II transmitter and a Citizen-ship receiver. In those

est). He was successful right away, so he was instantly hooked. Flyaways were very common then, but Bill

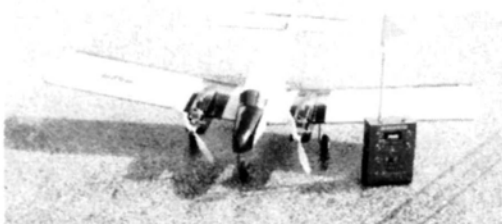


From the '50s, Pete Hendrick's first two successful R/C planes—the L.W. Trainer and the Cruiser.

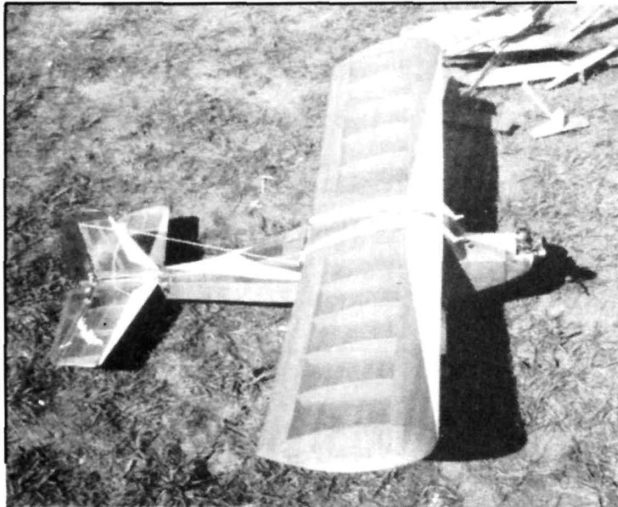
days, fliers often used a transmitter and a receiver of different brands, hoping to have the best type of each (integrated systems weren't necessarily the fin-

was fortunate to have only two. The second one was a total disaster, however: his L.W. Cruiser scrapped itself against the side of a house,

(Continued on page 88)



Pete Hendrick's OT Twin Viscount powered by Veco .19s The Twin showed dual-engine performance was very dramatic!



Fred Wolfe flies up a storm with his seemingly eternal OT R/C Live Wire Champion (details in text).

but Bill still has the urge for another, even after all this time!

Mike Keville of Lakewood, CA, wrote to invite me to the second annual C/L vintage stunt meeting, which he says was covered by the media and was a huge success. If an OT C/L stunt meeting can be so well received, how about R/C? (I hope the Vintage R/C Society will take note!)

Fred Wolfe of Fort Worth, TX, checked in with a request for plans of a particular OT biplane—a Live Wire, he thinks. There were only two Live Wire biplanes—the Custom and the Acrobat—and neither matches the picture he sent. The plane looks familiar, and I suspect it's a version of one of my original R/C biplanes. This plane was so simple and effective that several others tried it, too.

I had simply added a L.W. Trainer wing to the bottom of a L.W. Senior, and the increase in maneuverability with those first, heavy, Schmidt reed systems was remarkable. (Those first biplanes were interesting, and they're worthy of discussion—when

space allows!)

Fred now flies a L.W. Champion powered by an old Enya .19 with the original exhaust baffle, throttle and an E-K radio—no

GOLDEN AGE

doubt, on a legal channel! (A true OT R/C'er!) Tens of thousands of Champs were built during the 30 years when it was produced, so a Champ isn't unusual, but the *origin* of this one surely is. This particular Champ was given to Roland Schmidt (of Porky, Korker and Sniffer fame) about 15 years ago, but it had never been flown! Roland gave it to Fred, who installed the OT equipment and is now flying up a storm! James Sheldon of New York City starts his letter by saying, "If they call you 'Pappy,' maybe I should address you as 'Sonny,' because I'm 70 years old"? (Good question; but I'm not

saying who should call who *what!*) Jim is a retired seaman who has always been a modeler, but with limited workbench space at sea, he formerly made model boats. Retired, he can now pursue his real love—planes.

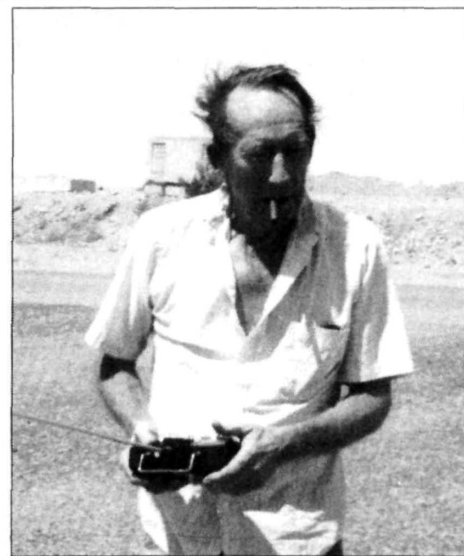
He was looking for plans for McGovern's Monster seaplane, which is a long-time dream for him. I was delighted to be able to refer him to W.E. Tech Service*. Remember, Bill Effinger at W.E. is the source of Berkeley Plans, and Don McGovern (another pioneer OTer) was also associated with Berkeley.

INTO AND OUT OF ORBIT—THE STORY

Here's the end of the Orbit story, which I started in my last column. Having made the company a success, Bob Dunham joined a conglomerate that made him an irresistible offer, and he went to Lake Havasu City, AZ—the home of the Schneider Cup Re-enactment. There, he operated an injection-molding plant that (among other things) provided the industry with plastic parts like gimbals and servo mechanics.

I had earlier organized Orbit Northeast as a distribution center and repair station for Orbit products, and we were very busy for a number of years. When Orbit changed hands, it was still business as usual, but there were very few new offerings. Dunham's energy and initiative had always made Orbit exciting, but the get-up-and-go had gone!

Eventually, businessman Charles Speer went into Orbit, and he was joined by "Big" John Elliott (now of Cox Hobbies), who provided the modeling expertise. Under Speer's control, Orbit continued to produce up-to-date systems. There were changes, e.g., the general trend toward miniaturization, but no more great leaps forward.



After a 20-year hiatus, Bob Dunham returned to R/C flying with his son Steve in 1989. (That's a Japanese "black box"!)

THE HAWK DIDN'T FLY!

Orbit offered an R/C system that was so different it wasn't accepted by modelers—it was

NEWS FROM ARKANSAS

Pete Hendricks of Rose Bud, AR, retired there from Miami, where he had been a member of the AMPS club. He quickly joined the MARCS club, which is one of the state's finest. I'm sure he enjoys being with pioneer H.A. Thomas and all the other good people at MARCS, and he also found time to write.

Again, I have to mention the Live Wire Trainer, because Pete started with one in '59. It was powered by a Fox .15 and guided by FM radio. He says everything went well for about 1 1/2 years, and then the old stab rubber bands broke (you can imagine the result!) Next, he tried an Enya .19-powered Cruiser, which he flew for a year and then sold. Its new owner installed reeds and a Veco .45

(must have been a "goer" with that power!) One day, a strong wind caught it, and it crashed (of course!), but into a cemetery—burial was immediate!

Pete says one of his fondest memories of reeds concerns his Twin Viscount. Again, he used an FM radio, but this time with 10 channels and reeds; power came from a pair of Veco .19s. (The Twin Viscount was a feature *MAN* article.) At that time, this twin was a bold step for me; I wanted to gain more thrust without having the drastic increase in airframe weight that comes with a big engine. If you can remember a typical 1950s' R/C performance, you'll be as amazed as I was by its first flight. It was initially powered by Fox .35s, and it followed the usual OT

(Continued on page 128)

ONTINUES!

Orbit Electronics



Bob Dunham's Orbit Electronics initiated the modern digital era with its 4-8 and 7-14 propo systems.

way ahead of its time! The Hawk systems offered major breakthroughs in cost and simplicity, but, for the most part, they were unappreciated.

Swapping the many metal parts for ones made of injection-molded plastic, and reducing the parts count wherever possible

led to significant cost reductions. Orbit produced the first all-plastic transmitter and receiver cases, which, although well-designed and beautifully made, did look more like toys than the "real thing"—the metal stuff, which was the norm.

The Hawk systems were nevertheless used by Cornell Laboratories to radio-control the automobiles that they used in a long-term investigations of crashes, and the system was also used to control a car that did a spectacular axial roll for a famous movie scene. Considering their relatively modest price and their unassuming appearance, the Orbit Hawks operated surprisingly well.

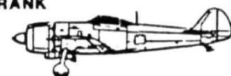
The second version of the Hawk was also state-of-the-art at that time. With this one, the aircraft control stick was replaced by a "wheel," and the other controls were arranged to suit car and boat operation. In retrospect, there probably just wasn't enough demand for such specialized R/C equipment.

Orbit didn't disappear overnight, but just seemed to fade away. Only Mr. Speer could tell us why. Was it the huge investment in tooling for the Hawk system and the coming of imports? Whatever the cause of Orbit's demise, it was modeling's loss.

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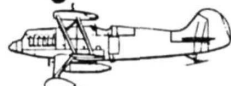
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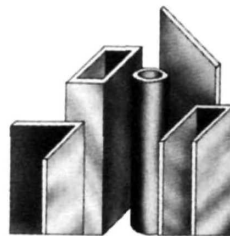
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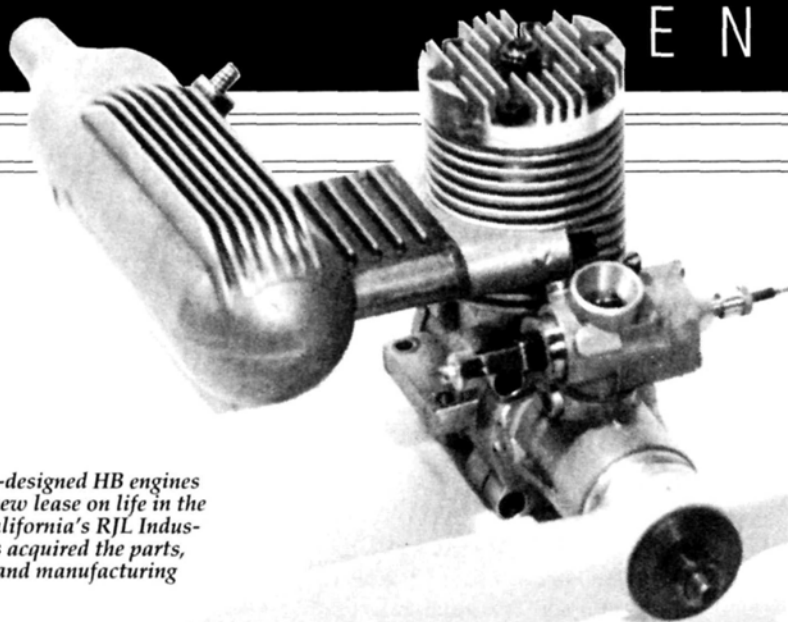
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ABOUT THOSE ENGINES



German-designed HB engines have a new lease on life in the USA: California's RJI Industries has acquired the parts, tooling and manufacturing rights.

by JOE WAGNER

ACT NOW! DON'T DELAY! That's my advice to readers who see an interesting product advertised or mentioned in a model magazine. Whatever it is, it won't be available forever—it may not even be available for more than a few months!

Metal Klean is a good example. Three years ago, in this column, I recommended this high-powered solvent for removing the dark-brown, baked-on deposits that accumulate on some model engines during prolonged running. The only mail-order supplier of Metal Klean I knew of then still gets occasional orders from procrastinators, even though the manufacturer (the Sunbeam Company) discontinued production early in '89 and later filed for bankruptcy!

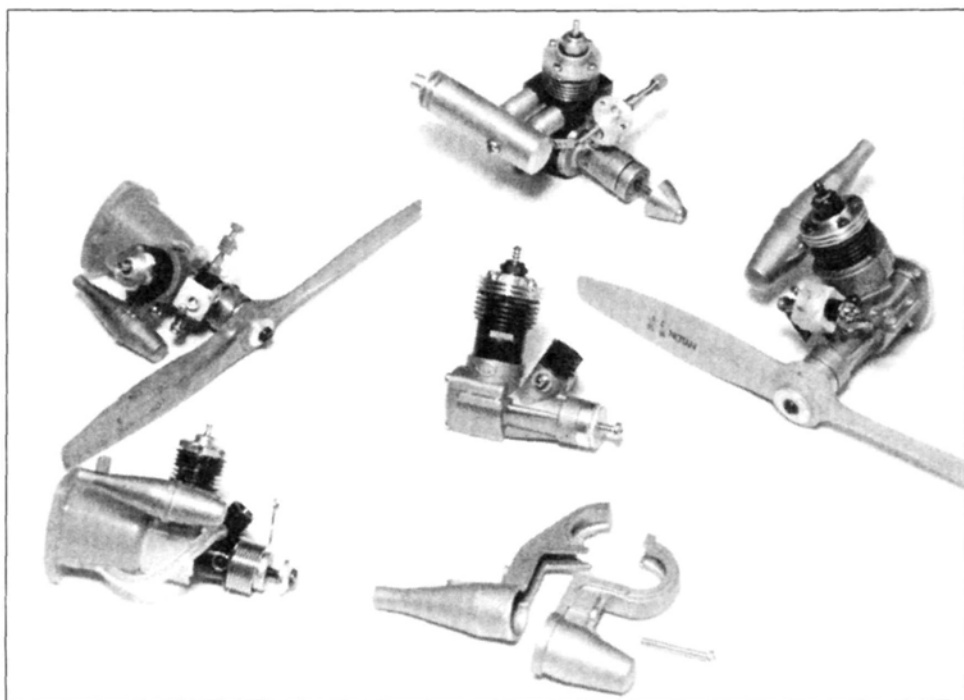
Many companies in the

model business are small, and some are essentially one-man operations, e.g., Herb Wahl's antique model-airplane motor factory, or Technopower II,

Inc., manufacturer of beautiful miniature multi-cylinder radial engines. If anything happens to the one man who performs most of the work, the company

can't continue to supply its products.

That's what occurred with the once-popular German HB motors, whose original designer/manufacturer was killed in an accident a few years ago. Despite an attempt by John Perry (of Perry Airmotive, Inc.) to re-establish the company, HB engines are still unavailable. This may change soon, however: I hear that Randy Linsalato (of RJI Industries*) has bought all the remaining HB parts and tooling, and he hopes to restart production of the motors at his factory in southern California.



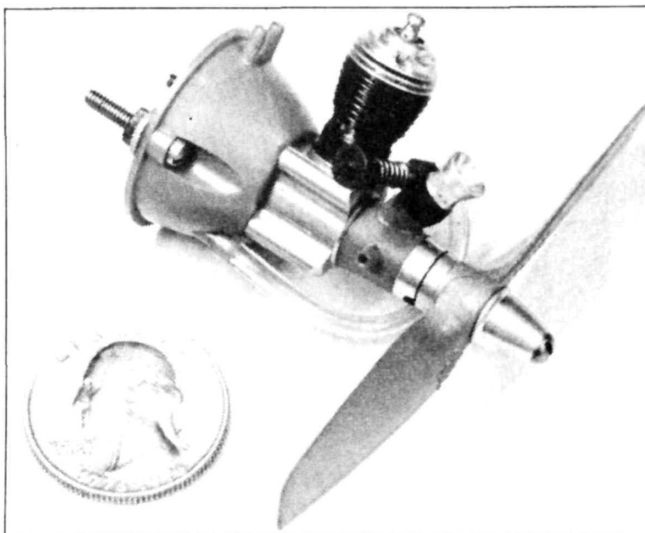
G-Mark 1/2As are available again, in R/C and standard versions. The .03s are on the left; the .06s are on the right and in the center. (Note the ingenious muffler design.) At the rear, is an early G-Mark—the Seagull.

I have even better news about a similar case. G-Mark engines were impossible to obtain for several months last year after the maker of the line died. Now, the company is under new ownership, and the 1/2A motors are back in production! (Unfortunately, it's doubtful whether the multi-cylinder G-Marks will be made again.) Cannon R/C Systems* remains the U. S. importer and has in stock G-Mark .03s and .06s (in both R/C and standard versions).

More good news: finally, the Cox* Tee Dee .010 is back on the market! Discontinued for so many years, this tiny jewel of a motor had become a collectors' item, worth as much as \$100 in its original package! Lately, so many modelers have pleaded with the

folks at Cox Hobbies that they agreed to reissue the world's smallest production glow engine. (If you want to buy one of these unbelievably tiny powerplants, don't put it off! There's no guarantee how long Cox will make them.)

One more item I recommended recently that's apparently no longer available is Klotz Blendzall. I'm glad to report that the product itself—a castor oil chemically modified to be soluble in gasoline—is still on the market, though, under the new name of Klotz Green Formula 2-Cycle Racing Castor. My secret agent in Toledo, Bob Stykemain, tells me that Klotz was forced to stop using the Blendzall label as a result of a lawsuit by another company, which had earlier registered Blendzall as its



Back again: the world's smallest mass-production model engine. Cox Hobbies' Tee Dee .010 has just been re-issued!

trademark.

Bob assures me that Klotz Green Formula is easy to find at motorcycle shops, and he uses it in his spark-ignition engine fuel with no mixing problems. (Stock castor oil won't blend with gasoline, although it readily dissolves in alcohol and ether.)

I bet you've never had this much good news all at once!

*Here are the addresses of the companies mentioned in this article:

RJL Industries, P. O. Box 5, Sierra Madre, CA 91025.

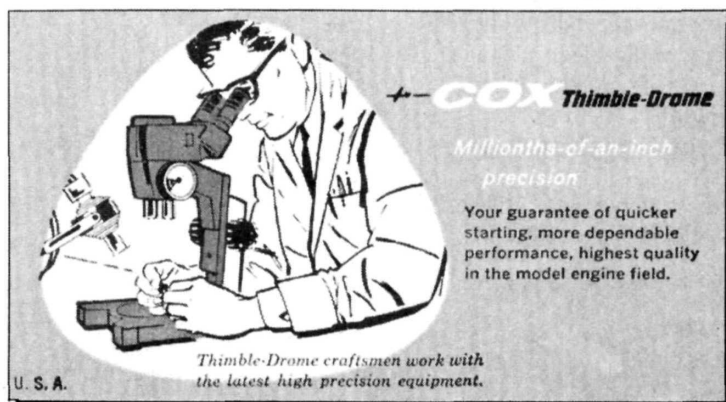
Cannon R/C Systems, Inc., 2828 Cochran St., Suite 281, Simi Valley, CA 93065.

Cox Hobbies, Inc., 1525 East Warner Ave., Santa Ana, CA 92705. ■

THE THIMBLE-DROME MYSTERY THEATRE

MANY MODELERS, INCLUDING MAN Editor Rich Uravitch, have asked why some Cox engines are called "Tee Dees." The initials TD stand for "Thimble-Drome," the name Roy Cox used to identify his product line for many years. But what does "Thimble-Drome" signify?

I found out from Roy Cox himself in 1948, over a year before he manufactured his first model engine. At that time, Roy's business made die-cast-metal scale models of dirt-track racing cars, primarily for newspaper subscription premiums and similar youth-oriented prize programs. For this product line, he



thought up the Thimble-Drome brand name.

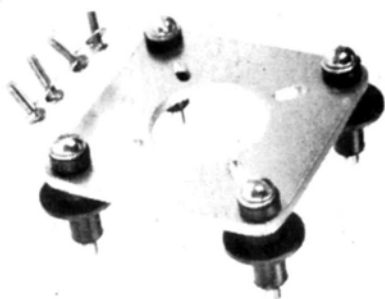
He chose "thimble" for its secondary meaning of smallness (now obsolete). (A similar usage appeared in the original title of the "Popeye" comic strip—

Thimble Theatre.) The "drome" part of the name comes from motordrome, which was what some Californian racetracks were then called.

Does anybody have any more mysteries for me to solve?!

PRODUCT NEWS

Descriptions of new products appearing in these pages were derived from press releases by the manufacturers and/or their advertising agencies. The information given here does not constitute endorsement by Model Airplane News, or guarantee product performance. When writing to the manufacturer about any product described here, be sure to mention that you read about it in Model Airplane News.

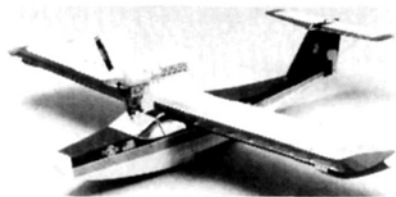


J'TEC Backplate Engine Mounts

Many modelers prefer to use backplate mounts for their front-intake engines: they're light, easy to install, and they save room in the cowling. J'Tec now offers six sizes of Snuf-Vibe backplate mounts for all engines with .15 to 1.82 displacements. These aluminum mounts bolt directly onto the engine crankcase and are equipped with the Snuf-Vibe vibration-dampening system. To prevent vibration in the airframe, the backplate and fire-wall mounting bolts are completely encased in neoprene-rubber. Engines run more smoothly, so R/C equipment lasts longer. With this system, there's no engine shaking at low rpm, and the engine can be mounted closer to the fire wall. Each package contains one backplate mount, all hardware and instructions.

Price: \$14.95 to \$21.95, depending on engine size.

For more information, contact J'Tec, 164 School St., Daly City, CA 94014.



ACE R/C Seamaster 120

Designed by Ken Willard, the Seamaster 120 is a flying boat with a pylon-mounted engine and a T-tail that stays out of the spray during acceleration. A

high-lift wing and double-stepped hull enable it to get on plane and break water quickly. The retractable water rudder makes water handling at slow speeds easy. A 1.20 4-stroke or 1.08 2-stroke flies the Seamaster 120 at a scale-like speed while maintaining enough power for modest aerobatics. The fuel tank and the throttle servo are all in the pod for quick and easy set-up. Made of lite-ply, with lock-tab construction; a two-piece wing with a simple joining system and a removable tail make transportation easy. The Seamaster 120 will fly off land (the landing-gear hardware is offered as an option to make it a true amphibian). Wingspan: 85½ inches; wing area: 1,432 square inches; length: 75 inches; weight: 16 to 18 pounds. A 4-channel radio is required.

Part no. 50K231 (Seamaster 120 kit)
Price: \$199.95

Part no. 25K231 (Landing Gear kit)
Price: \$14.95

For more information, contact Ace R/C, 116 W 19th St., P.O. Box 511, Higginsville, MO 64037.



WORLD ENGINES Pro-Charge

World Engines' Pro-Charge charger incorporates a full-time trickle output, a trickle/fast-charge/discharge output, a timed discharge, automatic trickle-charge after discharging, a strong vinyl-clad aluminum case, indicator light for power input and an indicator light for each power output to prevent polarity reversing and shorting. It will accept either a 110V AC or a 12V DC power

input. The Pro-Charge has a 5-year limited warranty.

Part no. 10155

Price: \$104.95

For more information, contact World Engines, Inc., 8960 Rossash Rd., Cincinnati, OH 45236.



RADIO CONTROL DEVELOPMENT AM and FM R/C Receivers

These 1991, AMA-listed, "Platinum Performance" AM and FM R/C receivers will convert any '80s-vintage Futaba or Airtronics R/C system to "bullet-proof" 1991 interference-free operation. Features include: pager-proof operation; full-house, 7-channel AM or FM performance; solid, fixed-crystal construction (which guarantees tune-free operation with FCC-legal AM and FM transmitters); and a fuelproof, super-dense "flight-preserver" vibration- and crash-isolation cover. Plugs can be interchanged with all Futaba "G" and "J" AM and FM, or Airtronics AM or FM R/C systems. The receiver's smallness (83x1.45x2.43 inches) and lightness (less than 1.3 ounce) are advantages. Each receiver is tuned and tested for the most rigorous vibration and radio-interference conditions.

For more information, contact Radio Control Development, Inc., 2131 Old Oakland Rd., San Jose, CA 95131.



DREMEL Freewheeler Kit

Dremel's new 8508 Freewheeler cordless Moto-Tool kit includes the 850 Freewheeler, 851 charger unit, keyless chuck, 30 accessories and a new plug-in charging case. The new case has a special design that allows the tool to be charged while it's stored. On the go, the case holds the Freewheeler, charger unit and accessories.

For more information, contact Dremel, 4915 21st St., Racine, WI 53406.



APPLIED ENGINEERING Plane Saver

Many crashes are caused by dead or dying receiver batteries. Plane Saver will warn you that your batteries are low, so you'll have time to land safely. The unit (which weighs less than 1 ounce) is installed between the receiver and the throttle servo. When battery capacity falls, Plane Saver automatically lowers the maximum throttle setting. Unlike other systems, Plane Saver gives you throttle control all the way down. It also has a low-power CMOS design, and it can be used with a servo in normal or reversed mode. It comes factory-set for 4.6V, but it can be adjusted from 4.4 volts to 6 volts. The unit works with 4- or 5-cell packs of any capacity.

Price: \$39.95

For more information, contact Applied Engineering, P.O. Box 5100, Carrollton, TX 75011.

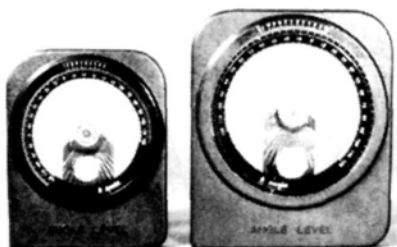


ROBBE MODEL SPORT Prefabricated Glider

Robbe's Hawk was designed especially for glider novices who are looking for a large, prefabricated glider that has docile behavior and an excellent glide angle. The Hawk can be launched with a high-start or with the optional Robbe pylon tank and a .09 engine. It's also capable of slope-soaring in light breezes. The kit includes: ready-made Plura fuselage; "Jedelsky"-type, prefabricated wing-panel components; die-cut and sanded tail plane; R/C hardware; decals; plans and instructions. Wingspan: 110 inches; length: 51 1/2 inches. A 2-channel radio is recommended.

Part no. 3159

For more information, contact Robbe Model Sport, 180 Township Line Rd., Belle Mead, NJ 08502.



CANNIC ASSOCIATES AcuAngle

The AcuAngle is a light, compact angle level that can instantly set or measure horizon, pseudo-horizon, or any inclined angle, and it's accurate to 0.1 degree. Its pointer, with micro ball bearing, smoothly rotates in hydraulic oil to give a stable, precise reading. It features annular graduation for checking the relative angle when working on a non-horizontal plane. AcuAngle can be used to set or measure any angle on any project. It comes with a double-rail magnet base and a slot for extending rule.

Price: \$28.50 (A-100); \$48.50 (A-300).

For more information, contact Cannic Associates, Inc., P.O. Box 2206, Arcadia, CA 91006.



INDY Clipped-Wing Cub

The IMAA-legal Clipped-Wing Cub, which comes 92-percent assembled, has a hardwood and balsa built-up wing that's covered by a colorful layer of plastic film. The Clipped Wing Cub comes with a fuel tank, spinner, shock-absorbent landing gear and wheels. It's finished in an attractive, red-and-white starburst pattern with tinted blue windows. (It's also available uncovered.) Wingspan: 79.2 inches; radio: 4 or 5 channels; engine: 2-stroke .75 to .90 or 4-stroke .90 to 1.20.

Part no. 21880 (covered)

Price: \$279.95

Part no. 24446 (uncovered)

Price: \$245

For more information, contact Indy, 10620 N College Ave., Indianapolis, IN 46280.



GREAT PLANES Ultra Sport 40

The Ultra Sport 40 flies like a pattern plane, yet handles like a gentle sport plane. It tracks like an arrow through every imaginable maneuver—from sustained knife-edge flight to crisp four-point rolls—yet it has no bad habits. It comes with parts that fit precisely, a complete hardware package, computer-drawn plans and a photo-illustrated instruction manual. Its interlocking design makes the Ultra Sport 40 easy to build. Wingspan: 55 inches; wing area: 566 square inches; length: 49.5 inches; weight: 6 pounds; engine: 2-stroke .40 to .45 and 4-stroke .60 to .70. A 4- or 5-channel radio is required.

For more information, contact Great Planes Model Manufacturing, P.O. Box 788, Urbana, IL 61801.

FLOATING AROUND

SCHNEIDER '91, FLOATING MAILBAG AND OTHER NEWS

by JOHN SULLIVAN

Schneider Corner

IF YOU'VE ALREADY read my "Schneider Meet" report in this issue, you know how excited I am about this event. In the months preceding the November '90 race, I'll present Schneider highlights as a regular feature of this column. I'll also do a construction article on the Schneider Racer that Mike Johnson and I are building for the 1990 race. This is a rare opportunity to show you the evolution of a high-performance floatplane and to help

ter pod housing push/pull engines and the pilot. The Savoia is an unusual choice, but I wanted something different. Between 1913 and

were seven Supermarines, four later Macchis and three identical early Macchis.

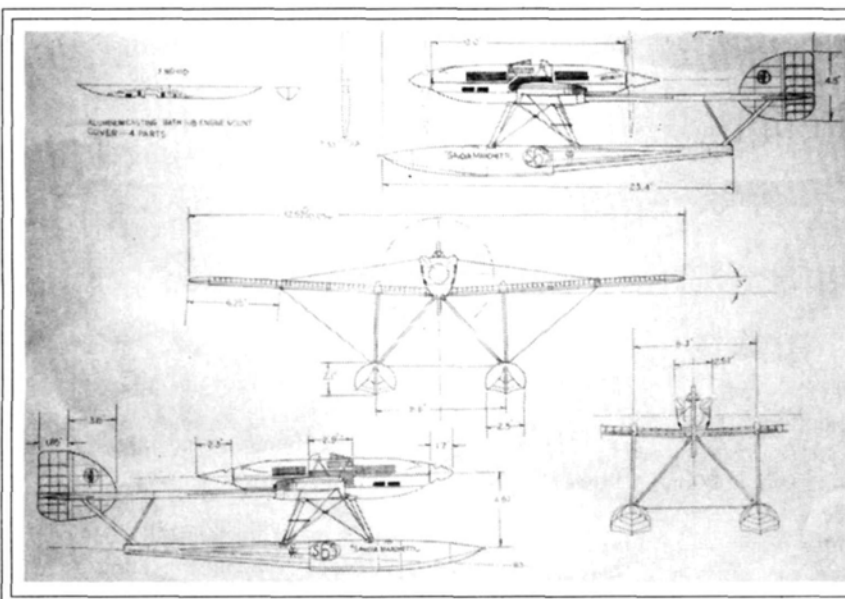
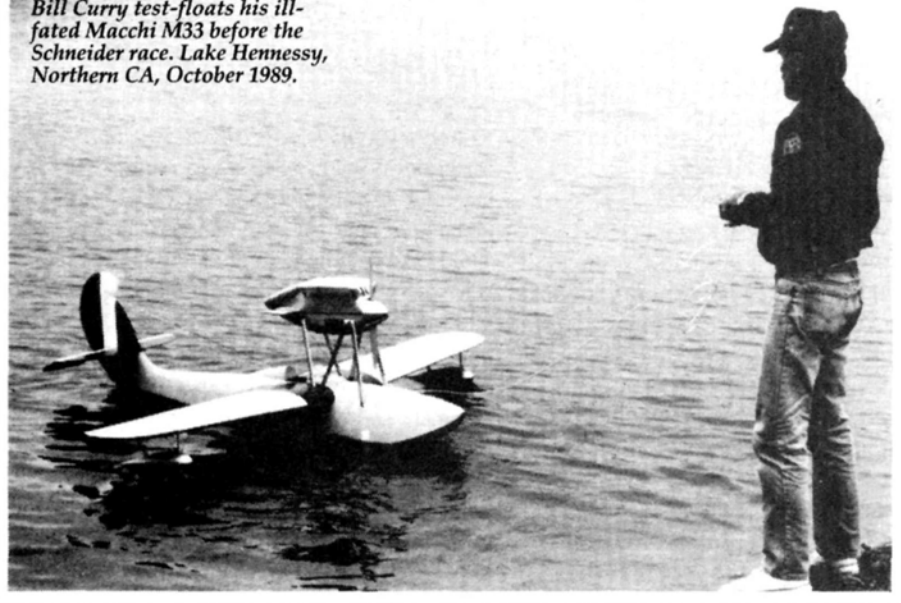
The constant-chord wings support two booms, and this

extension shafts running fore and aft to bearings at the prop hubs. The forward portion of the main pod will house a fuel tank, and there will be an impeller on the forward shaft to force air back around the G62's head.

The rear pod section will house a tuned pipe for the Zenoah, and the entire center pod will be composed of a carbon-fiber, reinforced-fiberglass pan carrying the engine, shafts, bearings, etc., with a fiberglass top shell. The wings and floats will be of glassed foam; the booms and struts of aluminum; and the empennage will be a combination of foam and built-up sections.

By the time you read this, you'll have about eight months to build and test-fly an entry, and this is ample time for one person. There should always be a special place, or perhaps a handicap advantage, for a single entrant, but a team approach

Bill Curry test-floats his ill-fated Macchi M33 before the Schneider race. Lake Hennessy, Northern CA, October 1989.



Sullivan and Johnson's choice for the 1990 Schneider Cup Race: a 1929 Savoia-Marchetti S65.

those of you who are building an entry.

I've selected a 1929 Savoia S-65, and as you'll see from the photo, it has a cen-

1931, 88 different floatplanes were eligible for or competed in the Schneider races. Of the 21 entrants in the '89 re-creation, there

traps the horizontal stabilizer with the fin mounted mid-span at stab. I plan to mount an inverted Zenoah G62 just in front of the cockpit, with

can be a lot more fun. Whether you share plans or actually build and fly together, teamwork can be very rewarding, and problems can be solved more effectively in a group.

To get you started, I've included the names of some people who can be very helpful. (Their addresses appear at the end of this column.) Bob Martin*, the 1989 event chairman, edits the Schneider Cup News—an *indispensable* source of rules, dates, lists of eligible aircraft, documentation requirements, target speeds, etc. (The increased demand for this publication will undoubtedly make a subscription fee necessary.)

Robert Hirsch* is an aviation historian who has compiled a set of three-views for almost a third of the racers, and he plans to do the entire series. The three-views are extremely accurate, beautifully drawn, and can easily be used to develop minimal plans for one-off projects such as this.

Jack Wismar* is a technical business consultant who has developed a computer program geared to models that resurrect a set of aircraft formulas called the "Osborne Numbers." With this program, Jack can input basic information on your plane, and the program will tell him if your plane will fly, how much horsepower it requires, its projected speed, and its flight characteristics. Mike Johnson and I are using this program to determine the minimum fuselage section needed to house the Zenoah engine. With engine size determining span, model size, and approximate



Jim Hursch's Weston Sea Era sitting still for picture. Saito 1.3 twin cylinder power.

THE FLOATING MAILBAG

I received another care package from Ed Westwood, who has printed a collection of technical data and reports compiled from the first three years of Ed and Charley Chamber's *Northwest Float Flyer*. This publication is loaded with important information, tips and design criteria, and there are reviews of floats and land-plane conversions. The "Ed Westwood Anthology" is available for \$6.50 (postage included).

Ed also sent a photo of Jim Hursh's Weston Sea Era, which *MAN* reviewed in October '89. The Sea Era is actually a prototype for a full-scale, two-place pusher amphibian. Hursh installed a

I can tell you that success couldn't happen to a nicer guy than Paul Weston.

A while back, I wanted to hear from float fliers to see how they handled floatplane retrieval. While in Havasu, AZ, I received a nice photo of Jim Morton and Bill Mellott's R/C rescue craft. The retriever is of a twin-pontoon configuration, and it's made of foam and is epoxy-glassed. An electric trolling motor provides the power, and the ship can be broken down for transport to a package 4 inches square by 1 inch thick. The platform is very stable, light, easy to transport and, except for battery charging, totally maintenance-free.



Jim Morton and Bill Mellott of Phoenix, AZ, built this retrieval craft for R/C floatplanes. (See text for info.)

glass engine cowl, and it houses a Saito* 1.3 twin. A heavy gloss paint job contributed to the plane's weight of 15½ pounds, and its performance was less than that of the .90 2-stroke version.

Kyosho has expressed an interest in the manufacturing rights to the Sea Era,

*Here are the addresses that are pertinent to this article:

Ed Westwood Anthology, 909 South 173, Spanway, WA 98387.

Saito, distributed by United Model Distributors, 301 Holbrook Dr., Wheeling, IL 60090.

weight, Jack can suggest horsepower requirements, prop diameter and pitch, and force arrangements.

Documentation is also important. Bob Martin published an extensive list of sources in one of last year's newsletters, and I hope that he'll print them again. Sadly,

many of the best books on the subject are currently out of print, but libraries could be your salvation. Scratch-building a Schneider Racer is a formidable project, but it's well worth the effort.

The Schneider Cup event will grow quickly, and with that will come new plans,

kits, engines, floats and gear. The event will become a bellwether for anyone in-

involved, and the possibilities for promoting model aviation will be limitless.

AQUATIC CHIPMUNK

Over a year ago, Carl Goldberg Models* introduced the Chipmunk. When I first saw this plane at the Pasadena I.M.S. show, I thought it would make a wonderful aerobatic floatplane. Ray Simone, one of our local fliers, thought so, too, and the results are shown here.

Ray is a fastidious builder, and the above-average quality of the Chipmunk kit and its instructions allowed him to build a great model.

Ray installed a set of 36-inch Sullivan Floats* that were glassed with 6-ounce cloth and epoxy resin. He used the supplied aluminum gear for the front strut and fabricated a duplicate for the rear with 1/8-inch music-wire spreaders, and he holds it on with wheel collars. The deck clamps were made from stock T-section aluminum, which is available at hardware stores and lumberyards. Although the T-section aluminum makes excellent deck-mounting clamps, it only comes in 6-foot lengths (enough for about a dozen floatplanes). Ray used grey, green and yellow MonoKote*—a refreshing departure from the stock red, white and blue Chipmunk color scheme.

The Chipmunk is powered by an O.S.* 90 Surpass. This extremely reliable powerplant uses a music-wire shaft with a brass water rudder that works directly off the air rudder. (The water rudder is effective and almost invisible in flight.)



Ray Simone's O.S. 91-powered Goldberg Chipmunk taxis in after a successful first flight.



Simone fires up his Chipmunk while Grey Gleefe holds. Aerobatic models don't usually need a sub fin.

This is only Ray's second floatplane. His first was a Great Planes* PT-20 Trainer that he kept in perfect condition and flew for more than a year. The aerobatic maneuvers that he performed with his PT-20 always seemed to be out of sync or erratic, but when he flew the Chipmunk, you'd have thought a new flier had joined the club. The difference lies in the Chipmunk's ability to translate Ray's inputs into aerial poetry.

On the water, high-speed sliding turns are stable and predictable; straight-line takeoffs and landings have become better than anything you could do on land; and in the air, point rolls are so tight that the Chipmunk appears to be on a ratchet. Vertical performance is good enough for double rolls and a graceful exit, and wingovers are slow motion at its best. The geometry, balance and force layout of this combination seem almost perfect, and the Chipmunk may

be just the ticket for intermediate pilots who want a realistic-looking floatplane with which to improve their abilities.

*Here are the addresses of the manufacturers mentioned in this sidebar:

Carl Goldberg Models, Inc., 4734 West Chicago Ave., Chicago, IL 60651.

John Sullivan Models, 1421 Second St., Calistoga, CA 94515.

MonoKote; distributed by Top Flite Models, 2635 S. Wabash Ave., Chicago, IL 60616.

Great Planes Model Manufacturing Co., P.O. Box 788, Urbana, IL 61801.

SHOWTIME

Spring is coming, and it's time to start watching bulletin boards and newspapers for news of float-fly events. The annual Floatplane-Paradise-Play-Till-You-Drop Clearlake bash is scheduled for May 11, 12 and 13, and it's where you'll find the best of the new floatplane kits and accessories. It's also a showplace for the upcoming season's finest scale and sport floatplanes and building

techniques. Already scheduled for this year are Bill Price's new Twin .40 Canadair, Ed Westwood's .40- and .60-size beasts and an ARF .40-size generic Schneider.

Put this one on your calendar! Contact the Lakeport Chamber of Commerce (707-263-5092) for lodging, and Art Young (707-994-6402) for meet information and flyers.

*Here are the addresses that are pertinent to this article:

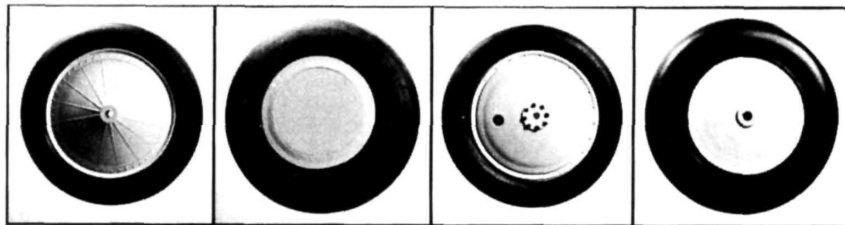
Robert Martin, 1520-C Acoma Lane, Lake Havasu City, AZ 86403.

Bob Hirsch, 8439 Dale St., Buena Park, CA 90620.

Jack Wismar Associates, 3584 South 3610 East, Salt Lake City, UT 84109. ■

SCALE WHEELS

RADIO CONTROL • CONTROL-LINE • FREE-FLIGHT



VINTAGE

sizes: 2 1/2"
1 1/2" 3 1/8"
1 7/8" 3 3/4"
4 3/8"
5"
6 5/8"

SMOOTH CONTOUR

3/4" 2 3/4"
1" 3 1/4"
1 1/4" 3 3/4"
1 1/2" 4 1/2"
2 1/4" 5 1/4"

GOLDEN AGE

sizes: 2 1/2"
1 1/2" 3 1/8"
1 7/8" 3 3/4"
4 3/8"
5"
6 1/2"

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2 1/2" 4 1/2"
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MIDWEST HOTS II

(Continued from page 83)

*Here are the addresses of the companies mentioned in this article:

Midwest Products Co., 400 South Indiana St., Hobart, IN 46342.

Satellite City, P.O. Box 836 Simi, CA 93062.

Hobby Lobby International, 5614 Franklin Pike Circle, P.O. Box 285, Brentwood, TN 37027.

World Engines, 8960 Rossash Ave., Simi, CA 93062.
Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.

Powermaster Products, 10103 Freeman Ave., Santa Fe Springs, CA 90670.

Master Airscrew; distributed by Windsor Propeller Co., 384 Tesconi Ct., Santa Rosa, CA 95401. ■

JIMMY DOOLITTLE

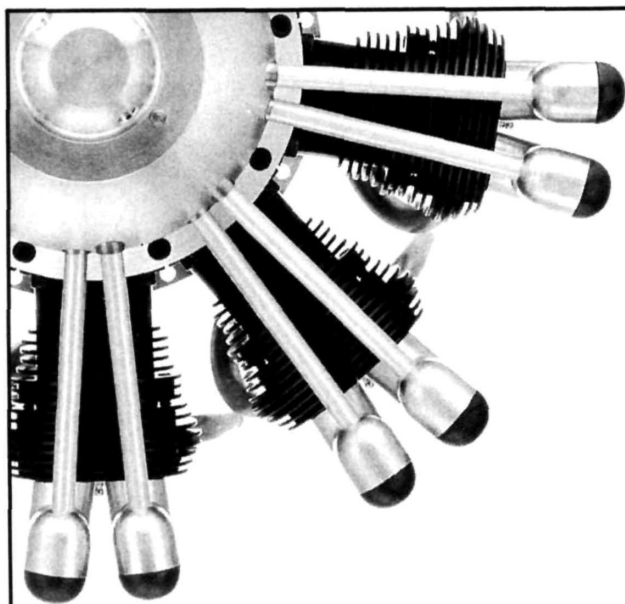
(Continued from page 82)

the big Zenoah was yanking the Gee Bee up to step plane at 1/4 throttle, and the plane was tracking beautifully with plenty of rudder control and not a hint of "wheelbarrowing." The wind had shifted 180 degrees from normal for this session, which forced Mike to take off facing a rat's nest of high-power lines 200 yards upwind of the last patch of water. Mike taxied downwind until the Gee Bee was just a speck, turned into the wind and applied power. By the time he hit half-throttle, the Gee Bee was in the air, and Mike was calling for someone to dial in down trim for him. He almost stalled on the first turn, but managed to bring it around, gained altitude and got on an oval course around the lake.

No one was talking. Halfway through the 10-minute flight, the Gee Bee snapped violently twice and then resumed a steady course and nothing was said. All eyes were riveted on the Gee Bee: it was apparent that Mike was in a lot of trouble. After about eight minutes, Mike began a slow descent, still flying an oval pattern. On the last round, he shifted the pattern partly over land to bring the Gee Bee in line with the lake on the upwind leg. The Gee Bee was twitching all the way down. The best information we had was that the Gee Bee had to be brought in at a 3-point attitude or it would tumble end for end. Mike did the best he could, but stalled 3 feet from touchdown. The Bee cartwheeled and finally came to rest floating upright. One flying wire had been ripped out, and some MonoKote had been ripped off a wing tip, but the Gee Bee was OK.

After the flight, I asked Mike why he had snapped the Gee Bee. He replied that he hadn't done anything except reposition his hold on the right stick. In the split second it had taken Mike to lift his thumb

(Continued on page 118)



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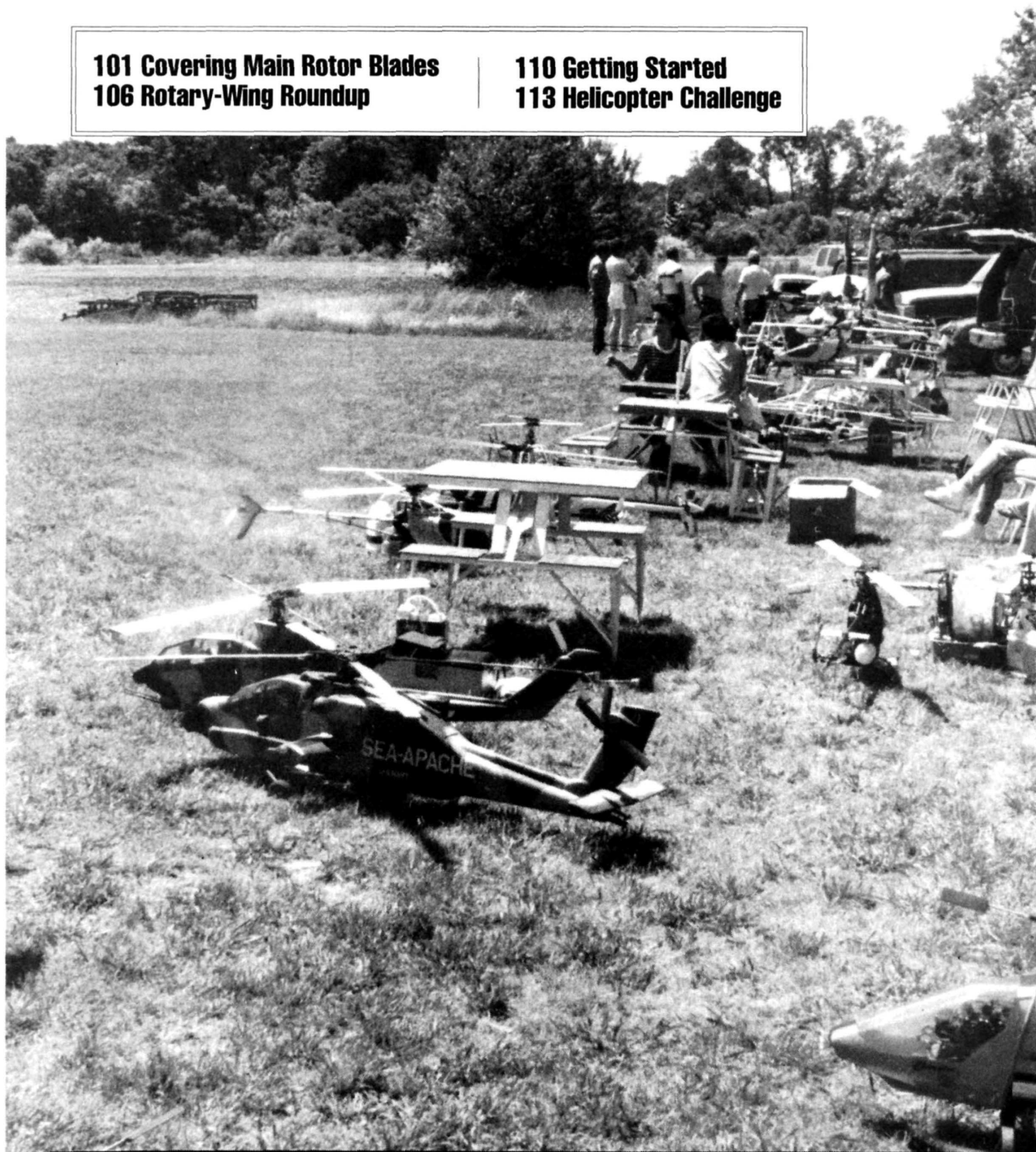
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HELICOPTER SECTION

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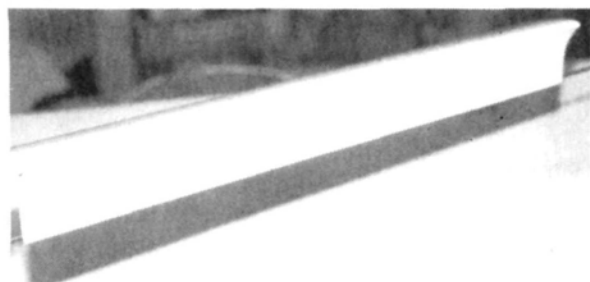


COVERING MAIN ROTOR BLADES

by CRAIG HATH

HEAT-SHRINK TUBE OR VINYL SHEET?—TAKE YOUR PICK!

ROTOR BLADES CAN be covered with adhesive-backed vinyl or heat-shrink tubing. Both are acceptable, but people disagree about which is best. Some think that heat-shrink tubing lifts off the blade as it spins, creating a bubble which could alter the airfoil in flight. (This could hinder the helicopter's performance and even cause oscillation or vibration.) Proponents of heat shrink, on the other hand, claim that



Before attempting to smooth it down to the bottom of the blade, slowly work the covering over the leading edge.

this only occurs if an inferior covering is used, or if the heli is run at an extremely high rotor speed.

I've heard that some modelers spray their rotor blades with an aerosol adhesive (e.g., 3M 77) before they apply the heat-shrink tubing! This combines the ease of application of heat shrink with the adhesiveness of gum-backed vinyl. I don't want to enter the controversy: I'm only passing along the techniques that I use for both types of material.

ADHESIVE-BACKED VINYL

Let's start with the technique for covering with vinyl. Sand both blades smooth, using at least 220-grit paper, vacuum the sanding dust off the blades and remove any traces with a tack rag. This is important to ensure good adhesion of the covering material.

Vinyl covering usually comes in two pieces, which are cut longer than the rotor blade and wide enough to go around at least once with some overlap. Lay a blade

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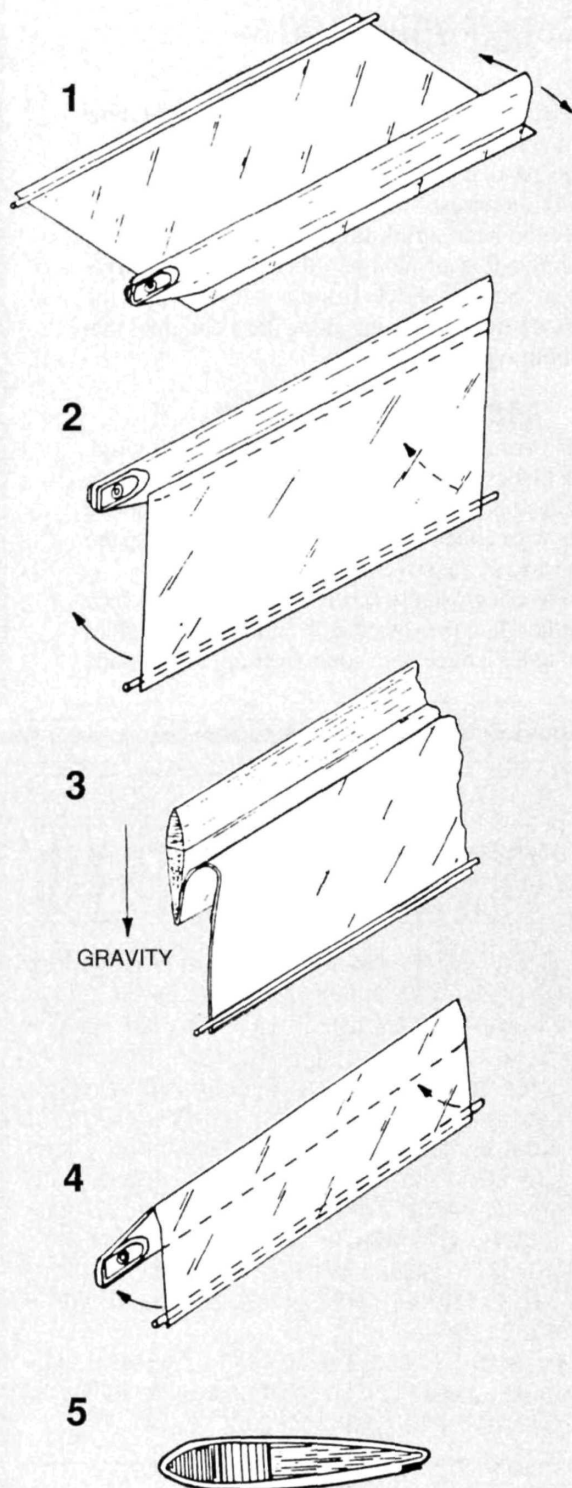
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ART01#9





These drawings show a painless, step-by-step way to cover your blades with vinyl sheet.

over the covering so that the covering butts against the blade grip. (Don't cover the grip with the vinyl.) Use a straightedge and razor to trim both pieces of covering to the length needed to cover the blade all the way to the tip.

Lay one piece of covering on a flat, clean surface. Hold it down with one hand and remove the protective backing by slowly pulling it back with the other. Be careful not to wrinkle the covering—once it contacts itself, it won't come apart!

Place a piece of music wire (approximately $\frac{5}{32}$ inch in diameter and slightly longer than the covering) about $\frac{1}{4}$ inch in from one side of the covering. Place the rotor blade on edge at the opposite side, approximately $\frac{1}{4}$ inch in, with the bottom of the blade facing out (see drawing). Roll the blade toward the edge of the covering so that the $\frac{1}{4}$ -inch portion

Add tracking tape to the lighter blade's tip, only if the blade weights differ by .1 or .2 gram; a bigger difference will require you to add weight over the CG.

comes in contact with the bottom of the blade. Press along the top of the trailing edge to ensure that the covering adheres well.

Lift the blade carefully in one hand, trailing edge down. Use your other hand to smooth the covering onto the blade. Working from bottom to top, press the covering down a little at a time along the full blade length. (Use a sort of pinching action while rubbing the blade.) When you reach the top, roll the blade over so that the leading edge is pointing down, and work the covering onto the other side. Be sure that there's good contact with the leading edge, and don't allow the material to wrinkle. This will ensure that the covering doesn't go off at an angle. The music wire helps to prevent the covering from flying up and touching itself.

Once the entire blade is covered, trim off the excess material at the trailing edge with a single-edge razor or modeling knife. Don't cut into the covering, and be sure not to overlap to the bottom side of the blade: you want the covering to stop right on the trailing edge. Go back over every inch of the blade with a cloth, pressing to ensure that the covering is smoothed down and stuck to the blade everywhere.

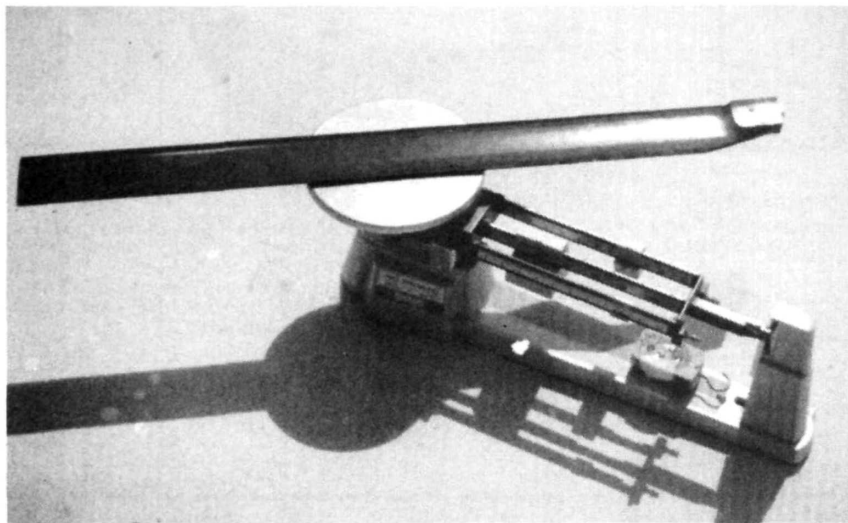
Paint the exposed portions of the blade with fuelproof paint, and allow it to dry. Repeat the whole process with your second blade. This method of covering is easy, if you're patient and work slowly!

HEAT-SHRINK TUBING

Covering with heat-shrink tubing is also easy. Start by sanding and cleaning the blades as before. Place a tea kettle, half full of water, on the stove. While the water

heats, cut a piece of tubing approximately 2 inches longer than the rotor blade, slide it over the blade and center it. You can cover the blade grips with heat-shrink tubing, or leave them exposed. I usually cover them because it looks better. Do the same to the other blade.

By now, the water should be boiling. Moving the



When the blades are completely covered, weigh them.

blade over the steam rising from the kettle's spout will cause the tubing to shrink. (The steam is the perfect temperature and won't melt the tubing like a heat gun would.) Move the blade over the steam along the entire length of one side, then turn it over and do the same to the other side until every inch is tightly and smoothly covered.

Next, while holding it over the steam, grab the excess on one end of the blade and fold it over; pull it

back and allow it to cool for a few seconds. Repeat this process until the tubing at both ends of the blade has "creases" heated into it. When the tubing has cooled, trim the excess almost to the surface of the blade, and put a few drops of thin CA onto the exposed wood. Let the CA cure for a few minutes, and finish the blades by

trimming off any remaining tubing. This step adheres the tubing to the blades on the ends and seals the bare wood at the same time. Cut the tubing away from the blade-attachment bolt holes and seal with CA.

PRE-FLIGHT CHECK

When you've finished either method of covering, compare the weights of the blades to be sure they match. If not, apply a piece of tracking tape to the lighter one. If the difference in blade weight is more than .2 gram, add trim tape over the CG of the lighter blade. You can also add different colored tracking tape to both blade tips if the

weights match.

Finally, balance your rotor-head assembly on a high-point balancer, with the fly bar and paddles installed (but not the rotor blades). If the head is perfectly balanced, you won't have to re-balance it every time you switch blades, because they're interchangeable.

Check the tracking, and you're all set for liftoff! ■

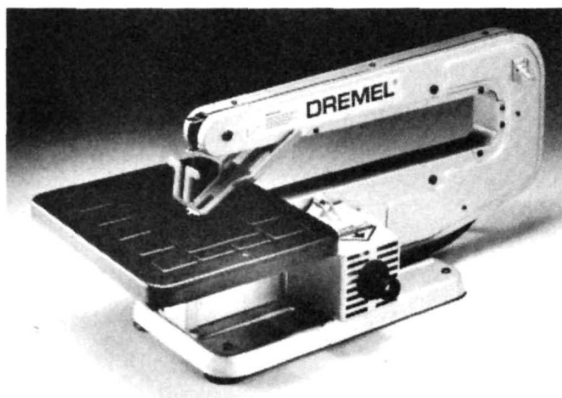
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Miniature Aircraft USA now offers the Scalesport Long Ranger fuselage kit (without mechanics). The kit includes an epoxy/Kevlar fuselage, white Tuff-strut II landing gear, scale screen and bubble windows, precision-machined woodwork, body filler and all the necessary hardware. Also available is the complete kit of the Long Ranger; it includes X-Cell .60 competition mechanics.

Part no. 2515; 1004 (complete kit).

For more information, contact Miniature Aircraft USA, 2324 North Orange Blossom Trail, Orlando, FL 32804.

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For more information, contact Vigor Co., 53 West 23rd St., New York, NY 10010.



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GREAT PLANES Kyosho Concept 30 Blades

Kyosho offers four types of blades for the Concept 30. The newest is the Deluxe Weighted one-piece wood blade, which has the latest shape and lightening holes drilled along the length of its trailing edge to correct its CG. Other blades in the group are: Expert Blades—Weighted; Sport Main Blades; and the standard PRO Main Blades. For safe blade storage, there's a convenient case. There's also a one-piece tail blade, which is super-light and provides for a "delta hinge."

Part no. KYOE5023 (Deluxe Weighted Wood Blades).

Price: \$37.95

KYOE5032 (Expert Wood Blades). Price: \$49.95

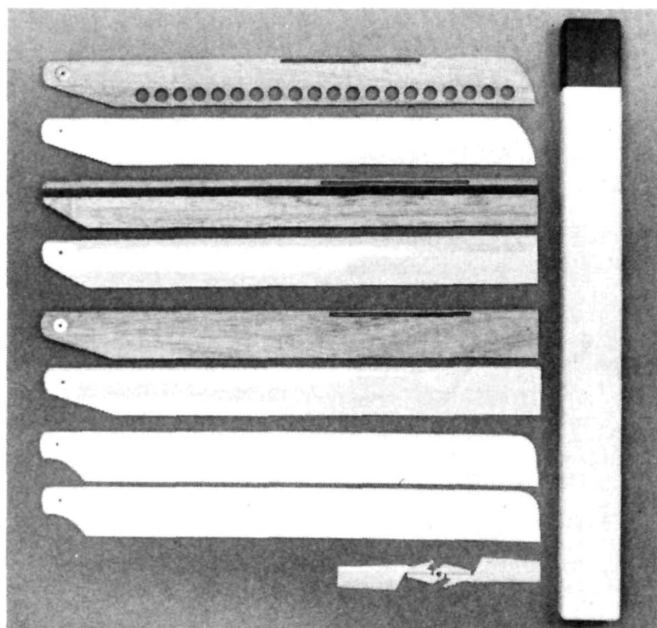
KYOE5034 (Sport Wood Blades). Price: \$24.95

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For more information, contact Great Planes Model Distributors Company, P.O. Box 4021, Champaign, IL 61820.



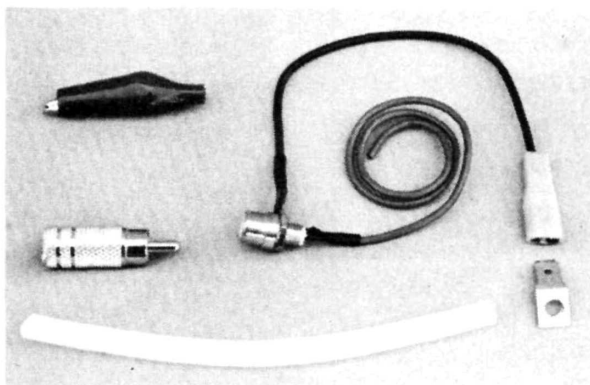
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ROBBE MODEL SPORT Remote Glow-Plug Starter Set

Robbe's Remote Glow-Plug Starter Set was introduced with the Magic and Magic Ranger kits, but because of popular demand, it's now available separately. It can be used on all Schluter helicopters as well as on kits by other manufacturers. This remote starter comes with everything shown here.

Part no. S2838

For more information, contact Robbe Model Sport, 180 Township Line Road, Belle Mead, NJ 08502.



GETTING STARTED

by JERRY HICKS

Without these goodies, your heli is just a static display model!



The Ni-Starter from McDaniel is an excellent example of available glow-plug lighters. Well-made, rechargeable and portable, it's a must in any field box.

YOU DECIDED TO try R/C helicopters. You bought a kit and the tools to build it, and you enjoyed putting it together. Now you can hardly wait to get to the flying field. You have everything you need, right?—but do you have what it takes to fly this heli?

Do you have an electric starter? Modern helis

have clutch-drive systems, so their engines can't be flip-started like those of their fixed-wing cousins, but must be started with a built-in belt- or cone-drive system.

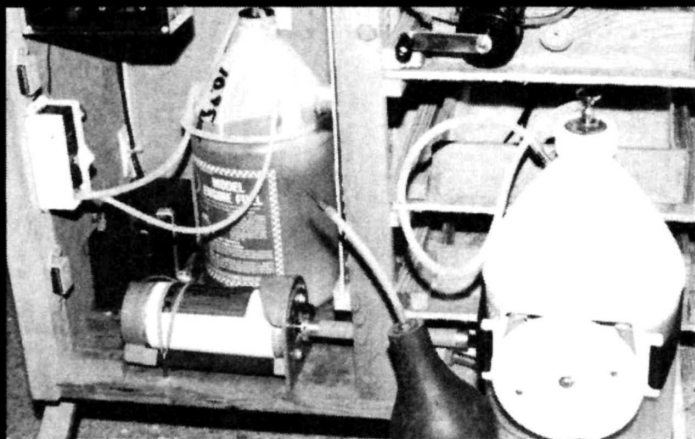
This means you must have an electric starter to turn the engine over, and you can choose from a wide range with a variety of torque values. Some units require that you squeeze a safety trigger to energize them; others have a simple trigger. Starters vary in diameter and the voltage they require (12 volts or 24 volts, DC), and some even have offset gearing.

The two Sullivan* units shown are excellent starters. The DynaTron has been called the strongest starter on the market, and although it isn't very large, I've yet to see it fail to turn over even large model engines. The other unit is the one most often used by heli fliers; it offers the same reliability, but not quite the torque, as the DynaTron.

SAFETY FIRST

When choosing an electric starter, think about safety. There's always a chance that you'll accidentally energize the starter. Having started their machines, many have a tendency to put the starter down rather carelessly, because they're focusing on the running engine, and not on the starter; and I've seen more than one trigger-type unit put down on its trigger. This causes the starter drive to spin at top speed, and anything that comes into contact with it—starter leads, clothing, and parts of the human anatomy!—can be "grabbed" by the extension and wound around it. You can use this type of unit, but

FILLER UP?



Before you can fly your heli, you obviously need fuel, and you'll have to get the fuel from its storage container into your model's tank. For this, you'll need a pump, filters and a fuel line. Fuel is usually taken to the field in 1-gallon containers, which can be fastened to your field box.

You'll use a pump to transfer fuel to or from the storage container. You

This photo shows nearly every type of fuel pump use today. Clockwise, from the top: a Du-Bro manual rotary (the small black one); a Du-Bro linear (in the cap of the fuel bottle); a Dave Brown Six Shoot (strapped to the bottle); a Sullivan squeeze bulb; and Sonic Tronics Mk. X (mounted to left side of field box).

be aware of its dangers.

Further, with some drive extensions, great downforce is needed to prevent the rubber from slipping on the cone. It's best if the starter has a hand guard to prevent your hand from slipping down it. I once had the silly notion that these little starter motors weren't very powerful. I grabbed a spinning drive with my bare hand, and couldn't move it for a week!

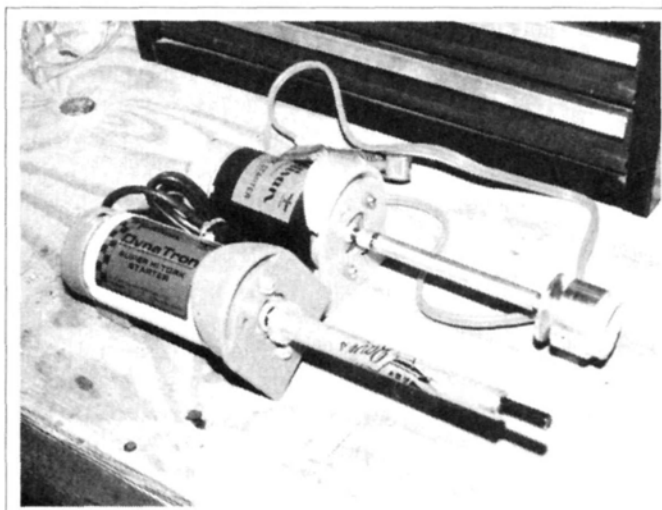
USING EXTENSIONS

Notice that the units shown have an "extension" on their drive ends, and this is what actually touches the heli's start driver. On the DynaTron, there's a unit from Rave's RC*, and it's my favorite. It has a hexagonal drive in the end, and this fits into the adapter on the heli start shaft (for a positive engagement). This unit requires that you acquire the drive extension and an adapter for your helicopter.

The Standard adapter is from Sullivan, and it's of the rubber-insert variety. The heli's original drive cone is retained, and the rubber in the end of the extension is pressed downward onto it to drive the cone. There are several other brands on the market, including units from Du-Bro* and Miniature Aircraft Supply*.

There are two considerations when deciding whether to use a mechanical drive or a rubber drive:

- The rubber drive will work fairly well as long as the drive cone and rubber are absolutely free of fuel residue; if there's anything slippery on either component, the drive won't engage properly.
- Rubber drives have a tendency to jump off the cone when you remove them from an engine that's running. Several of my paint jobs have been marred when a rubber cone spun across them leaving a little tornado



These two Sullivan electric starters are equipped with extensions. The DynaTron model is fitted with a hex-drive type from Rave's RC, while the Standard has Sullivan's own rubber drive.

pattern in the finish; so if you use a rubber drive, be careful when removing the starter from the cone.

You might be wondering what the extension is for. That's easy; look at the starters in the photo. You'll notice that the units are rather large in comparison with the space available for them near the rotor head. The starter drivers are almost always placed near the main shaft, and this makes it difficult to align the starter properly with the drive. The extension allows the starter to be positioned above the rotor head, directly over the drive for a good contact.

GLOW AND GO!

Turning the engine over properly will be for naught unless you have a way to energize your glow plug. Some machines, such as those from GMP*, have accessible glow plugs that face the

can use a squeeze bulb like the one shown, or a hand-operated rotary unit, which, when you turn the crank, pumps fuel out of the can and into the tank. Reversing the direction of rotation reverses the fuel flow. These pumps are efficient, uncomplicated, and require only hand power.

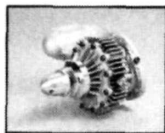
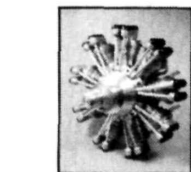
The advantage of Du-Bro's linear hand pump is that it almost fits into the fuel container; only the operating handle and fuel line remain outside. To transfer fuel, the handle is pumped up and down. Turning the pump valve a quarter of a turn returns the fuel to the can. This efficient product takes up little room in the flight box, and since the pump is an integral part of the fuel container, it's impossible

to forget it and leave it at home.

For those who aren't manually inclined, there are electric fuel pumps, which are very convenient for transferring fuel. With just a flick of a switch, you can also quickly de-fuel your heli. Naturally, they require an electric source (6V or 12V) to operate, but you already have that to power your electric starter! If the battery goes dead at the field, you'll have no way to fuel or de-fuel your heli, but it won't matter, because you can't start it anyway! If, like me, you use an electric pump, I strongly suggest that you have at least a squeeze bulb on standby so that you can de-fuel your heli before transporting it.

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GETTING STARTED

rear. On others, e.g., the ones from Schluter*, the plugs face forward as difficult to get to.

To increase accessibility, use a remote glow-plug connector. This is connected to the plug and the engine case or mounts (for ground) and runs two wires to a common "plug." An ignition source is then connected to the remote, which is easily accessible.

There are several ways to enhance this convenience. Many manufacturers of power panels offer a long cord that reaches from the panel to the remote connection for heating the plug. Its only drawback is that a helicopter can only be the length of the cord away from the box that contains the panel. While this isn't always a problem, it can make for cramped quarters.

Most heli fliers opt for the alternative: the self-contained, rechargeable, Ni-Starter. The product shown is from McDaniel RC*, and it has served me faithfully for many years. It's available in short-stem, long-stem and metered versions, and it can be used with a remote McDaniel setup.

POWER-PACKED

The electricity you need obviously comes from batteries, of which there are many types and capacities. Gel-cell batteries contain a chemical gel in which electricity is generated; lead-acid batteries use the more traditional lead-plates-in-acid method. I prefer the gel-cell, because with this type of battery, I don't have to worry about possible leaks if it falls over or is handled improperly. Batteries are available in either 6V or 12V configurations.

Between the battery and the electrical accessories comes the power panel, which takes energy from the battery and safely divides it between items like the pump, the starter and the glow-driver, fulfilling the unique power requirements of each.

Most power panels have a plug-driver outlet that's metered to tell you the condition of your plug. The panel should be attached to your field box securely, in a way that ensures there's no metal in contact with its rear face, where connection to the battery is made.

GETTING THERE

To move that large pile of equipment from the kitchen table to the field, you'll

need a field box, or flight box. This is a sturdy container for tools, spare parts (unless you're really confident), fuel, starter, driver, battery, pump, paper towels and cleaner, and whatever else you take with you. This box should be light, fuelproof, and have enough room to keep the battery and panel away from everything else.

You can use a cardboard box or a plastic milk crate, or buy a commercially produced container. Notice I said "plastic" milk crate. Using a metal one is just begging for an electrical problem.

I made mine; it has wheels! It also has several drawers, a sliding panel for seldom-used items, an isolated battery and power panel, space for the fuel container and two pumps (primary electric and backup manual), and room for any extra goodies I want to take along. There's even a special place in which to store the starter, which is cradled in a position that protects it from the dreaded "bent extension" syndrome.

Most of the field boxes on the market are intended for fixed-wing use, but they'll work quite well for us "rotor heads." Most have drawers or compartments for tools, and built-in places for the panel, the battery and the fuel can. Most can be tailored to suit your needs, and plastic boxes don't have to be fuelproofed! Of the many types available, one is sure to suit you.

So how do you decide between all the available choices? If you see someone using a product in which you're interested, ask about it. Before buying anything, look closely. The strongest starter on the market may not be comfortable in your hand. Ask questions; choose carefully; and spend wisely. Radio-control helicopter flight is to be enjoyed—not plagued by small problems that quickly grow into big ones.

*Here are the addresses of the companies mentioned in this article:

Sullivan Products, 1 North Haven St., Baltimore, MD 21224.

Rave's RC, 2005 Mt. Vernon Ave., Alexandria, VA 22301.

Du-Bro Products, 480 Bonner Rd., Wauconda, IL 60084.

Miniature Aircraft USA, 2324 N. Orange Blossom Trail, Orlando, FL 32804.

GMP (Gorham Model Products), 23961 Craftsman Rd., Calabasas, CA 91302.

Schluter; distributed by **Robbe Model Sport**, 180 Township Line Rd., Belle Mead, NJ 08502.

McDaniel RC, Inc., 12206 Guinevere Rd., Glenn Dale, MD 20769.

Helicopter Challenge

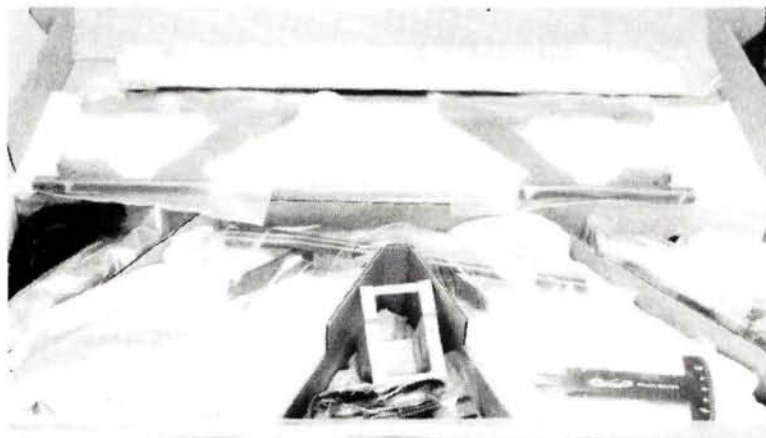
by CRAIG HATH

MORE BUILDING TECHNIQUES

THIS SERIES IS designed to help those who are new to the hobby. If you've been following it faithfully, you should have the basic equipment (helicopter kit, radio, engine and field gear) and all the hand tools and gadgets you'll need to build a model, and you're ready to begin construction.

To some, the task of assembling a kit will seem overwhelming; others may simply see a kit as a complicated Erector Set. If you open the kit's box

(Continued on page 114)



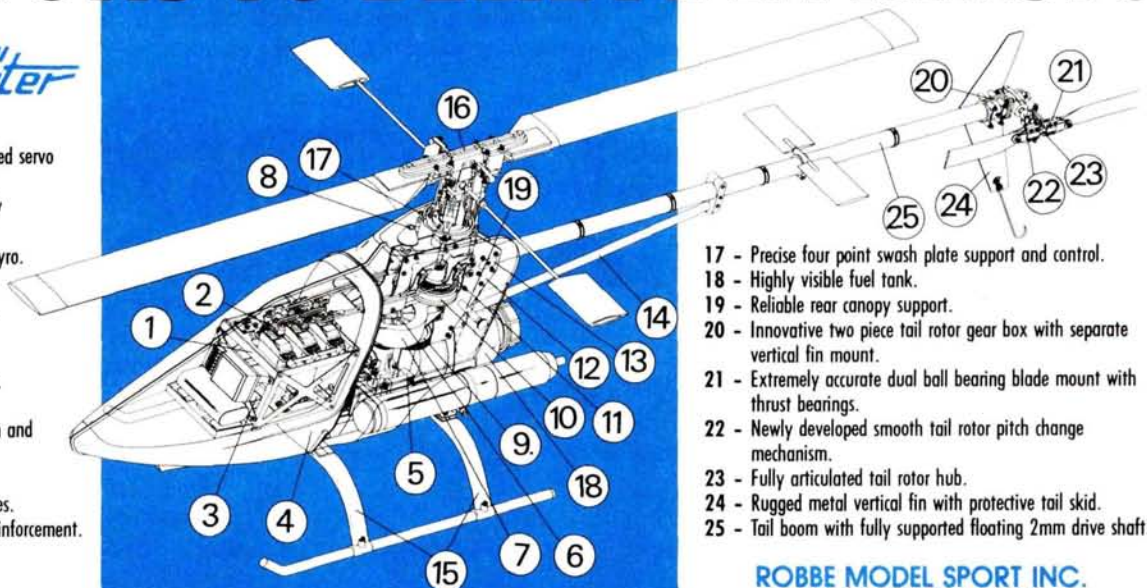
Bolt all the mainframe and sub-assembly pieces together, but don't tighten any of the fasteners until you've completed the powerplant and tail-rotor drive assemblies. This will ensure a smooth-running, bind-free setup.

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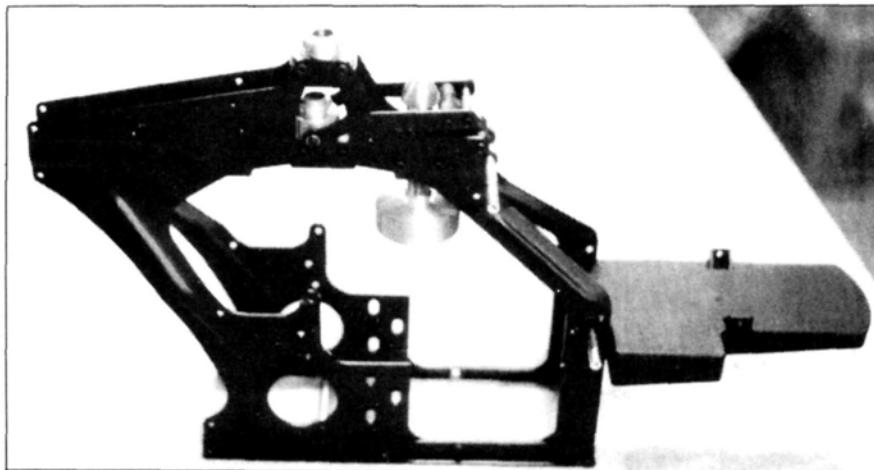
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HELI CHALLENGE



Don't panic when you see all those parts looking back at you! If you plan carefully and follow the kit's directions, you'll be able to assemble your new machine easily.

and get a rush of adrenaline when you see all those parts, step back, take a breath and relax! Building a model helicopter requires patience and common sense.

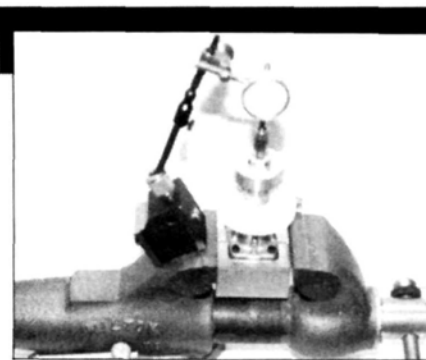
First, you must have a flat, smooth surface on which to build. I use one of the benches in my shop, and I cover it with an old towel to protect the parts and prevent them from rolling off the bench. If you don't have

to clear everything away between building sessions, spread out the parts so that they'll be handy when you need them: you'll often need a part (to check that it fits, or matches other parts) before it's actually needed for assembly.

Try to have everything you need before you start building, and don't try to perform any steps for which you'll need parts you don't have. If you do,

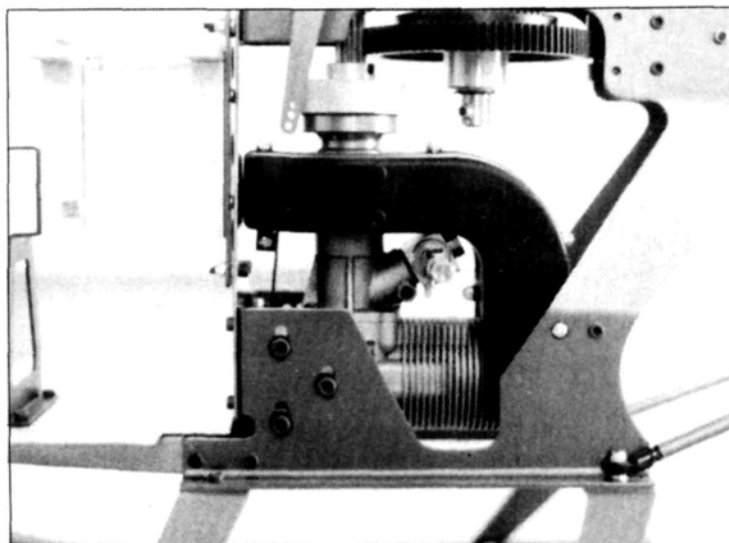
you'll probably have to redo steps, or you'll leave out important things.

As you assemble a kit, follow the instruction manual closely, and don't perform steps out of sequence (they're usually described in a logical order). If you don't understand the point of the step you're attempting, re-read the instructions while you hold the part, and try to envision the intended results.



If the instructions detail the alignment of the engine start-shaft assembly, be sure to follow them carefully, as vibration caused by a wobbling start shaft can destroy a helicopter from the inside out.

UP TIGHT—NOW OR LATER?



Carefully align the engine with the clutch assembly before setting the gear mesh. This photo shows perfect clutch/engine alignment.

Some instruction manuals tell you that, as you assemble the mainframes and sub-frame assemblies you should tighten the fasteners as you go, but I recommend that you do this *only* for frame doublers and braces. When you install things like bearing blocks, gear trains and motor mounts in the frames, alignment is important and should be perfect before the fasteners are tightened.

Think about the loads that will be placed on the bearing housings for the main shaft. Imagine the parts that are installed at angles to each other; perhaps the top and bottom blocks fitted closely enough to allow the main shaft to pass through them. As the shaft turns while it supports the rotor head and drive gear, it will also try to twist one (or both) of the support bearings. Assemble these parts into the frames loosely at first, and wait to tighten the fasteners until the main shaft has been installed. As the bolts are being "cinched down," check the alignment of the blocks and make sure that the main shaft will pass

SKIDS UP & ATS

A while back, Bob Botnik of Seattle, WA, called to tell me that I was wrong when I said that the ATS (anti-torque tail-rotor compensation) must be shut down when your plane flies upside-down. A few days later, I received a letter from my friend Ray Hostetler, and he said the same thing.

OK! I'm guilty of propagating an old wives' tale. This informa-

tion was passed on to me, and I had never *tried* to use the ATS system while flying inverted. I'll now set the record straight: when the plane is inverted, torque is the same as when it's upright, and rotor direction doesn't change at all, so the mix will function in the same way, whether control input is reversed or not. Thanks to Bob and Ray for pointing this out!

This brings me to identifying parts. Many kits include an "exploded" view of them, so it's easy to tell which is which. If your kit doesn't have such a view, try to identify most of the parts before you begin assembly. If you're completely confused, call the dealer or manufacturer for assistance.

Before you start, sort out the parts for each step. In an empty egg car-

ton, I organize small parts and hardware into appropriate groups, and as I complete each step, I check it off in the manual so that I can remember which step I was working on if I'm interrupted. See, it really isn't too difficult! You'll soon be airborne!

**Here's the address of the company mentioned in this article:
Loctite Corp., 18731 Cranwood Park, Cleveland, OH 44128.* ■

freely through both blocks simultaneously. This will ensure a smooth main shaft and drive system that doesn't bind.

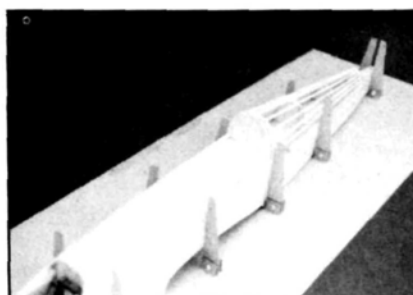
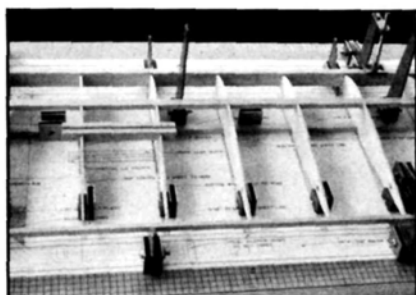
Take care with the alignment of the frame halves during construction: it's possible to set your machine up so that it lists to one side or the other, or that the frames might be twisted in respect to one another. To prevent this, build with the frames resting on a flat surface. Be aware of potential problems, and check for them as you go. Remember that you're trying to construct a solid, square base on which to attach the moving assemblies that must work together so that the machine flies reliably.

Ideally, you should install the major, moving components relatively loosely, and then tighten and align the parts with the frames placed flat on the workbench. Start by tightening the main-shaft blocks and work your way outwards until the parts mesh properly and move freely; then go over each nut and

bolt once more to ensure that you didn't miss anything.

A word about thread-locking compounds: as you assemble your machine, any fastener that isn't attached to a nylon insert nut (or to plastic) should be coated with a small amount of thread-locking compound. I use Loctite* Threadlocker 242 (blue) for all the parts that may have to be removed occasionally, and Threadlocker 271 (red—stud and bearing mount) for parts that have to endure a lot of vibration and those that are inaccessible for usual maintenance. If you use Threadlocker 271 on a particular part, you might have to heat it to remove it, so use 271 *only* where necessary. When a fastener to which thread-locking compound has been applied loosens you must remove it, clean it and re-apply thread-locking compound before replacing it. If you don't do this, your helicopter might disassemble in mid-air!

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JIMMY DOOLITTLE

(Continued from page 98)

and set it back, the Gee Bee had completely flipped out! A few more changes were obviously in order!

During the week before the second test flight, Mike dialed 3 degrees of downthrust on the Zenoah and retrimmed the elevator setting to alleviate the Gee Bee's skyward tendencies. He also replaced the radio with one that offered exponential control and set the Gee Bee up with a soft center response on rudder, aileron and elevator.

SUCCESS & COINCIDENCE

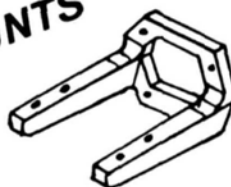
The following Sunday looked ominous. If the Gee Bee crashed or proved unflyable, Mike would forget about going to Havasu the following Wednesday. Then a very unusual thing happened, which seemed to mark the tone of this whole venture. As we were setting up the Gee Bee on the beach, a local mechanic named Gino Ferrario just happened to drive up to see what was going on. Gino took one look at the Gee Bee, said "I have something you guys have got to see," and ran to his truck. Gino came back with an envelope that had been given to Gino's father by a friend who had witnessed the 1933 crash of Russell Boardman's Gee Bee R1. Inside, we found a piece of fabric from the wrecked R1 along with a clipping about the crash. We quickly realized that we were holding a piece of the plane that Jimmy had flown to victory in 1932! Mike took the swatch of fabric and touched it to the wing and fuselage of the Gee Bee, then set about to fly the plane.

When Mike flew the Gee Bee again, I'm positive Boardman's presence was there. Whatever was happening, the plane flew predictably and relatively smoothly. It was still a handful, but Mike got it up and put it down without incident. We were ready for Lake Havasu and Jimmy Doolittle.

When we got to Havasu, however, we learned that Jimmy wasn't able to attend the Schneider recreation. It wasn't a let-down, though; we felt that this meeting was going to take place, one way or another. During the weekend, we made a few lame attempts to find out who had contacted Jimmy in the first place, but to no avail. Sunday morning, as we were driving out of the parking lot, two guys literally jumped in front of our truck and said, "You should show this plane to Jimmy Doolittle."

(Continued on page 124)

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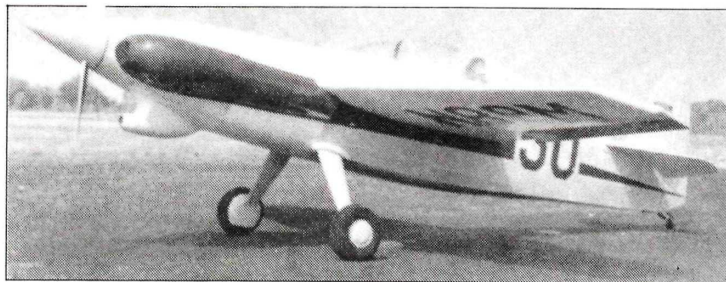
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NAME THAT PLANE

CAN YOU IDENTIFY THIS AIRCRAFT?

If so, send your answer to **Model Airplane News**, Name That Plane (state issue in which plane appeared), 251 Danbury Rd., Wilton, CT 06897.



CONGRATULATIONS to Michael von York (age 17) of Springfield, VT, for correctly identifying the Sikorsky Model VS-316A shown in our February 1990 issue. Mike covered all the bases by also identifying its British designation, "Hoverfly 1." His entry was drawn from the 106 correct answers received! Congratulations are also in order for the Loesch family of Moorestown, NJ, for sending in 16 entries. In spite of that valiant effort, they still weren't drawn first.

The Sikorsky VS-316A (USAF R-4) was a two-seat helicopter de-

signed for training missions. Its three-blade rotor spanned 38 feet. The fuselage structure was welded steel tube, and sheet-metal panels were used only on the forward portion; the rest was covered with fabric. A 185hp, 7-cylinder



Warner radial with a cooling fan supplied the power, which was transmitted through a double-reduction gearbox. This gave the 1-ton whirlybird a max speed of 75mph, and it took an astounding 45 minutes to climb to 8,000 feet! No need to fear bird-strikes; with that kind of performance, the birds had plenty of warning!

Four weeks following publication, the name of the winner will be drawn from correct answers received on postcards delivered by U.S. Mail. The winner will receive a free, one-year subscription to **Model Airplane News**, or a free, one-year extension, if already a subscriber.

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JIMMY DOOLITTLE

(Continued from page 118)

I'm sorry I didn't get the names of these men, but the gist of the conversation was

that one of them had flown with Jimmy's son, John, and he told us how to contact John. Talk about being out of control and on a roll—that was us! We drove across

California, arrived at the coast at midnight, spent the night in a motel and called John Doolittle from a coffeeshop the next morning. After hearing our story, John said he would contact Jimmy and get back to us. Twenty minutes later, the phone rang: Jimmy would be delighted to see us.

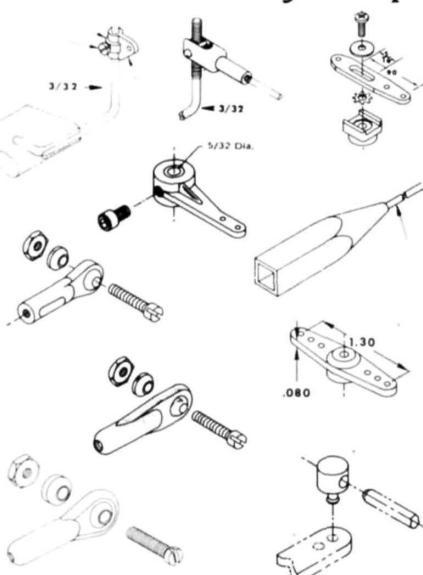
Meeting Jimmy was like nothing that had ever happened to either of us before! There is nothing you can do to prepare for the impact the man has. At 93 years of age, Jimmy still has a stride to his walk. I'll never forget the smile that spread across Jimmy's face as Mike pulled the Gee Bee fuselage out of our truck. "You know," he said, "they never put a Gee Bee on floats." Mike explained that we had hoped the Gee Bee would be allowed to fly in the Schneider as a plane of the period that *might* have flown had the race continued. Jimmy thought for a minute and said, "I'll bet they didn't buy that!" (They hadn't.)

We told Jimmy about the Schneider Race and the Curtiss R3C-2 while Mike plugged in the Gee Bee's wings and handed the transmitter to Jimmy. Jimmy moved the sticks around while Mike

(Continued on page 128)

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JIMMY DOOLITTLE

(Continued from page 124)

mentioned the snap-rolls, and Jimmy told us how the same thing happened 5,000 feet over Cleveland. When Mike related the incident of the scrap of fabric from Boardman's Gee Bee, Jimmy shook his head and said that he had known Boardman well.

There was a bit of silence while we all looked at the Gee Bee, then Mike asked Jimmy if he would sign the model. While Mike and John Doolittle held the Gee Bee steady, Jimmy put his signature, with a flourish beneath it, right in front of the cockpit.

As Mike was slowly easing the Gee Bee and its cradle back into the truck, Jimmy waved his hand and said, "Good-bye, little friend!" Throughout this entire adventure, and despite the coincidences that kept it going, Mike and I had questioned the wisdom of what we were doing. Jimmy has become a historical figure of such importance that to consider even approaching him seemed presumptuous, but in Jimmy's farewell, it all came together. Here was a man who had watched the hangar doors slide shut on the Gee Bee R1 at Bowles Agawam Field 57 years earlier.

Mike took the Gee Bee home, removed the radio and engine, and hung the proud bird high in the vaulted ceiling of his living room. It will never fly again. The model has become a piece of the fabric of history that will pass through generations, an object to illustrate stories about a man named Jimmy Doolittle and a plane named the Gee Bee R1. ■

GOLDEN AGE

(Continued from page 89)

takeoff procedure: hold on up-elevator, then wait for it to run 100 feet or more before seeing it gingerly lift off.

So, for the first Twin flight, I held the "up" on, and that *could* have cost me the plane! After about a 20-foot run, the Twin broke into a vertical climb and kept going while I watched—dumbfounded! Fortunately, my senses caught up, and I leveled-off to fly a never-before-seen display of aerobatics. For the first time, vertical flight was positive, and I flew victory rolls and all the associated good stuff. I was excited by the airplane's potential, but unfortunately, after only a few flights, one engine quit cold and the other went to full power on a landing approach. Bad news! The result was a flat spin with no recov-

(Continued on page 129)

CLUB OF THE MONTH

THE BROKEN PROP

THE WICHITA FALLS R/C CLUB P.O. Box 4796, WICHITA FALLS, TEXAS

THERE MUST be something about those southwestern winters, which "set in with the gusto of a hound-dog pup," that gives Texan modelers cabin fever. Members of the Wichita Falls R/C Club—*MAN's* club of the month—have been cooped up too long. Forced to stay inside cleaning and repairing their planes, they're getting restless to be flying.

The club's newsletter, "The Broken Prop," is full of spring-fever-inspired zaniness—jokes, brain-teasers and "Far Side" cartoons. Then, there are the rules and postulates relevant to our hobby, like the First Law of Construction, "Parts that positively cannot be assembled in improper order will be," or Schmidt's Law, "If you mess with something long enough, it'll break!" Also included are bull's-eye-like "Round Tuits" for those members who were reluctant to become involved until they got one. This club will try anything to boost attendance!

The Wichita Falls R/C Club stole that "round tuit" bit from the IMAA Quarterly and pilfered tips on how to shape tail-fairing blocks from the Clovis Model Airplane Drivers' Society, who had "borrowed" it from the Valley Forge Signal Seekers. We at *MAN* are all for spreading ideas! The drawings and tips were very helpful, too. Hey, wait!—those are "Hints & Kinks" filched from *Model Airplane News*!

This wacky club awards rocks (!!) to the member with the best model; Ray Hamel won for his 1/4-scale Zlin 526A Akrobat; and Crash-of-the-Month honors went to Kendal Hancock, the club's newest member. His Sig Kadet suffered a violent and tragic death—at the hands of another modeler, no less! At least Hancock found a replacement; he won the door prize—a Sig 4 Star .40 kit. Just don't let anyone else touch the transmitter this time!

The Wichita Falls R/C Club has its own Model- and Crash-of-the-Month awards, and now it's our Club of the Month! Congratulations, and enjoy your two free subscriptions!



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GOLDEN AGE

(Continued from page 128)

ery altitude!

Throttles were then far from reliable, and you never knew for sure whether the engine would respond from low to high. The problem was solved by switching to

Fox .19 engines; the reduction in power was less exciting than the .35 power, but the Fox .19s gave a fine performance without the flat-spin syndrome.

This all just shows how we were handicapped by the inadequacies of the early equipment—in this case, reliable throttles.

I wonder why twins haven't been tried for pattern competitions; their lightness and power would be an advantage, even to-day.

*Here's the address that's pertinent to this article:
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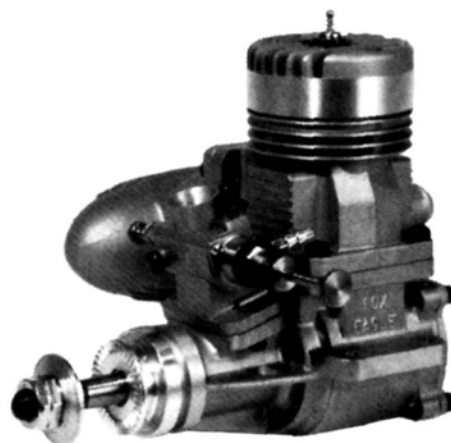
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Fox Eagle 4's are supplied with a conventional tilt down muffler. If a tilt up muffler suits your airplane better, you can exchange your tilt down merely by sending it to us and asking for an exchange. There is no charge for this. While we do not manufacture pipes, the Eagle 4 responds well to a conventional pipe installation. The screw spacing on our exhaust flange is similar to the Rossi screw spacing, and the hardware designed for either the Eagle III, Eagle 4, or Rossi will fit readily. When the absolute maximum power is desired, we recommend the use of our F size carburetor, which has an intake diameter of .350, in conjunction with one of the after market pumps on the market. The rear cover is fitted with a tapped hole to accept a pressure fitting if you have occasion to use case pressure for either pump operation, smoke operation, or some other case pressure use. The hole for the pressure tap is not drilled all the way through. To make the pressure tap functional, you merely remove the rear cover, drill the hole all the way through with a 1/16" drill, and then install and fit your pressure tap. The thread is a 4-40.



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